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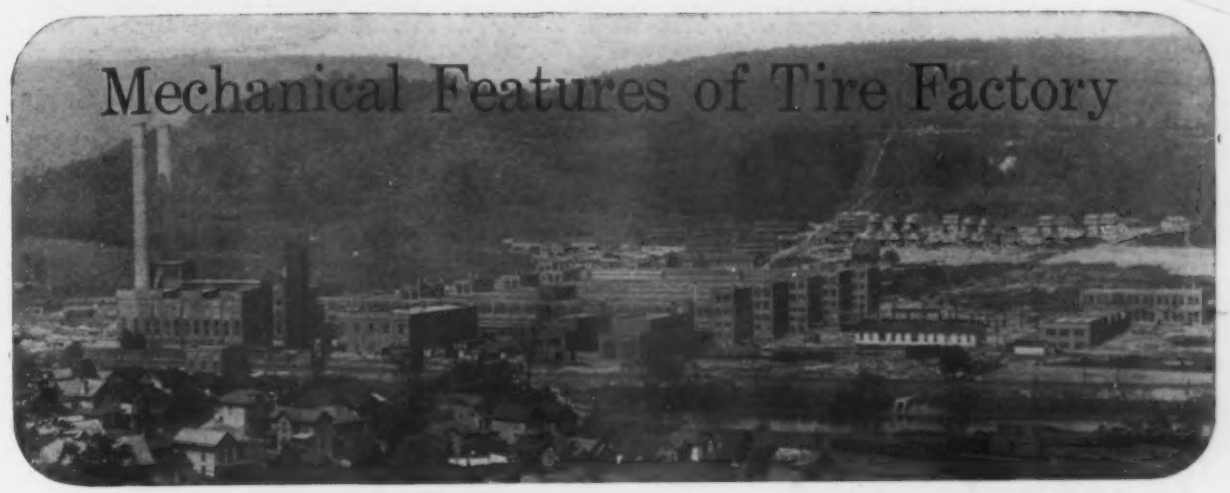


Designed for Economical Production, New Kelly-Springfield Plant Has Unusually Complete Inter-Connection of Mechanical Services—Tunnels, Piping, Wiring and Communication

DURING 1916 the Kelly-Springfield Tire Co. decided to construct at Cumberland, Md., a model tire factory, especially designed for the most efficient and economical production, rather than to enlarge existing plants. A general contract was placed with the Hunkin-Conkey Construction Co., Cleveland; while the structural steel was furnished by the McClintic-Marshall Co., Pittsburgh.

Ground for the new factory was broken in 1917, but war conditions made progress slow, the first plant unit—the mechanical building—being completed the following year. The intake building and pump house were completed during 1919; boiler house, garage, hospital and laboratory in 1920, and the main factory building in the early part of 1921.

Designs provided arrangement of the various processes of manufacture with a minimum amount of transportation and handling of materials in process. Provisions have also been made for future plant expansion to at least four times present capacity, and to carry out such extensions without interfering with production activities. Insofar as manufacturing cost of product is dependent upon plant layout, arrangement and equipment, it is believed that this plant will attain the maximum of economy in the manufacture of tires. Total cost of plant construction was about $12,000,000.

In the general view, illustrating the entire plant and its surroundings, the small building, on the extreme left on Potomac River bank, is the intake house, controlling the river water supply for process service and for fire protection. Building with the two tall stacks is the boiler and power house, with standpipe at the right. Next building to the right, the pump house, contains all pumps other than boiler feed. Accumulators, air compressors and fire alarm and watchman's control station are also located here. Next building to right is the mechanical building, and houses machine shop, tool room, pipe shop, pattern shop, tin shop, etc.

The large multi-wing building, immediately back of those just described, is the main factory unit. The low building to the right houses the employment department, as well as the temporary hospital. To the right of this are the laboratory and experimental tire building departments. In rear of laboratory is the garage, housing service and tire-testing cars, as well as repair shop. An H-shaped office building is to be erected on the extreme right. Factory offices at present occupy the second story of one wing of the main building, utilizing a space about 60 x 430 ft.

The entire undertaking was designed to meet, in the most efficient way, demands of the company's business, conforming in every particular with the most approved method of modern factory construction as adaptable to the rubber industry. In the designs were incorporated every feature that would add to the safety and comfort of employees, and provide the most ideal working conditions for them. This item in itself involved heavy expenditure.

The six large buildings, comprising the plant at present, are connected by underground passages for inter-department traffic; by conduits for carrying electric cables and by tunnels for the various piping services. Except the fire-lines there is no piping buried. Tunnels and conduits under the floors take care of all pipes and wires from the power house to designated distributing points and, from these points on, all cables are underground until they reach the final sub-stations and rise to upper floors.

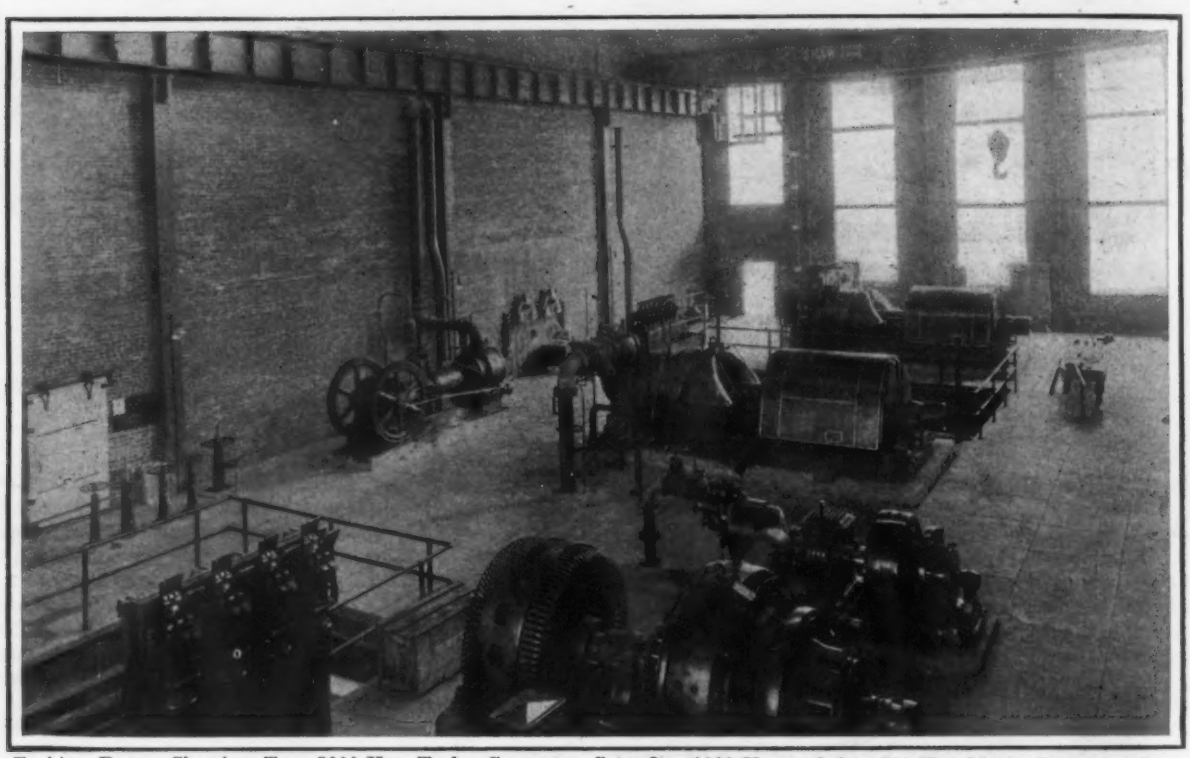
No electrical machinery on the first floor, or in the basement of main unit, has any cables other than those under the basement floor. Conduits were designed so as to make cables and wires readily accessible for repairs, extensions, etc.

About 125,000 bbl. of cement, 14,000,000 brick, 12,000 tons of structural and reinforcing steel and 7,000,000 ft. of lumber were permanently placed in this undertaking. In addition to these quantities, an immense amount of lumber and other materials were used in scaffolds, forms, sheds, bunk houses, commissary and

other construction facilities. The temporary structures, erected for the purpose of housing and feeding construction employees, were in themselves a small village.

The entire plant is safeguarded against fire through the installation of most complete fire fighting facilities, fire alarms and watchman's service. Hose houses, located at all strategetic points in the yards, are fully equipped with standard apparatus. All buildings have fire alarm boxes and watchman's service stations. All of these boxes and stations have telephones communicating direct with switchboard in the pump house. Fire mains are supplied by fire pumps, especially installed for this purpose, and are also so connected that plant service pumps may also be diverted to fire service. At the same time the entire fire system is connected to the city water mains. An automatic sprinkler system is also installed throughout the plant.

Ground area covered by buildings is about twelve acres, there being at present about twenty-two acres of floor space, over 80 per cent of which is devoted entirely to manufacturing. The entire plant is heated by utilizing exhaust steam.



Turbine Room, Showing Two 5000-Kw. Turbo Generator Sets, One 1000-Kw. and One 300-Kw. Motor Generator Sets and One Vacuum Pump. The ample headroom and light are evident, as is also the crane service

All sash are of steel, about 146,000 sq. ft. (3.4 acres) of glass being used in the main factory building alone. Glass is mainly of factory ribbed type, thus eliminating glare. All sash near floor levels have lower two rows of clear glass, thus permitting the workmen to observe outdoors. A large quantity of ribbed wire glass was used in sash at angles between wings of buildings, thereby reducing likelihood of fire communicating from one department to another by cutting across corners of courts.

The intake house, located on river bank, is of brick and steel, with concrete roof. All water, other than for drinking, passes through it by way of four screen-guarded concrete chambers and, after passing through moving screens of fine mesh, enters main water tunnel and continues over to power house. Branch tunnel is taken off to supply suction pit in pump house, there being no piping used between river and suction pits of the various pump installations. Intake house is about 42 ft. square, and, with river at lowest stage and with water entering at low velocity, has intake capacity in excess of the normal flow of the river at that point. This building has an overhead traveling crane to facilitate the raising of screens for inspection and repairs.

Boiler house and power house are built of brick and steel, with concrete roof and steel sash. Steam plant at present consists of six Stirling boilers of 750 hp. each, steel settings having been provided in present building for two additional boilers of same capacity. The boilers are capable of operating satisfactorily, and continuously, at least 200 per cent of rating. Steam plant is so laid out that it can be readily extended to any desired capacity.

Steam for operating turbo generator sets, and the different pumping units, leaves the boiler house at 175 lb. pressure and 100 deg. superheat, a loop system of piping being so arranged that superheated steam can be turned into saturated mains, or vice versa. Boilers have Foster superheaters, Riley stokers, Diamond soot blowers, Hagan combustion control, Bailey meters and other modern refinements that tend towards proper control and economical operation.

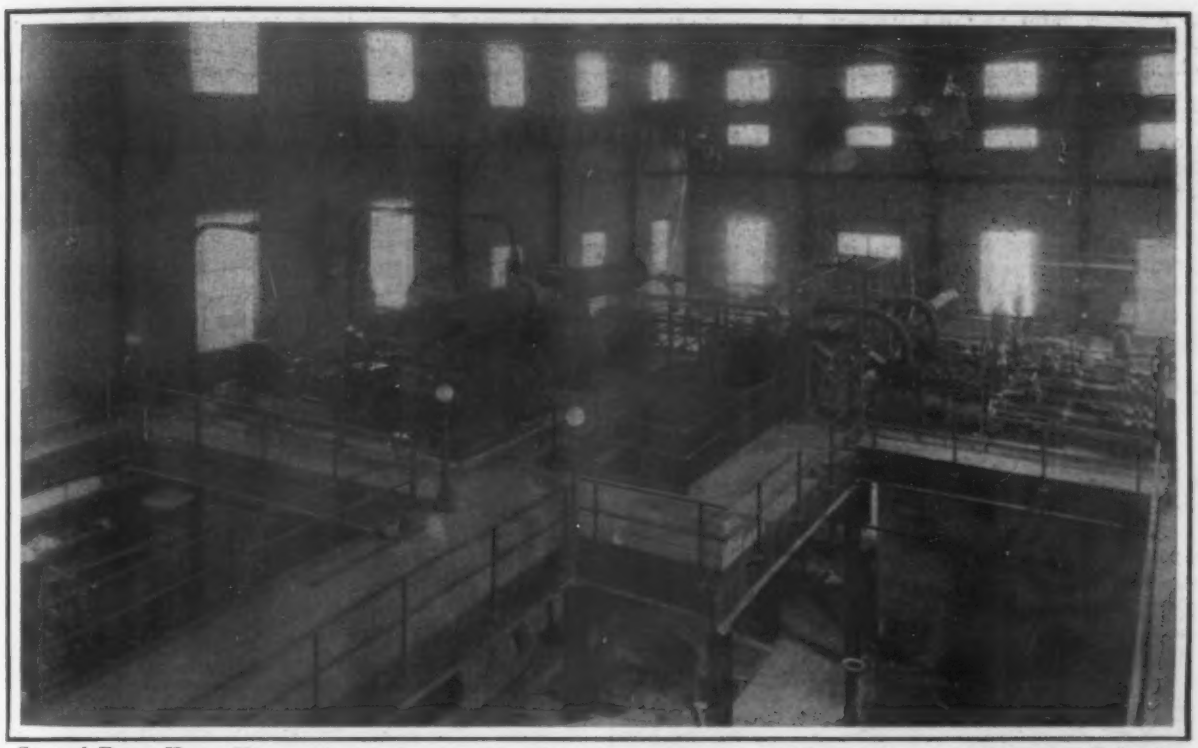
Superheaters are installed in front walls of boilers, with access from outside, by means of doors, and have low baffle walls between them and the combustion chambers. Stokers are of extra length design, each boiler having its own individual stoker drive. There are no line shafts, belts or chain drives used in any part of stoker installation, Sturtevant steam engines being utilized for driving them.

Coal siftings, passing through stokers, drop into hoppers below blast chamber and are, from time to time, removed by discharging into ash cars in basement tunnel, and then returned to coal supply at elevator boot.

Boiler ashes drop into fire brick lined cast iron hoppers, below floor level, having capacity for two days' operation. They are removed through specially designed water-sealed hydraulically operated gates, discharging directly into electric storage battery cars, which convey them to the storage pit, of about 600 cu. yd. capacity, located at the end of the coal storage basin. They are loaded from this basin, by locomotive crane, into standard railway cars, or motor trucks, for final disposal.

Fly ash, from rear pass of boilers, is removed by periodically permitting it to flow through pipes down into ash cars in basement. These pipes are provided with hand operated gates, so designed that there is no likelihood of their being left open unnecessarily.

Boiler settings are entirely of special design, the steel work being incorporated with that of the building. They were designed by S. Diescher & Sons, engineers, Pittsburgh. Drums and tubes were furnished



General Pump House View, with Air Compressors, High Pressure Pumps and Accumulators, and Operating Balconies

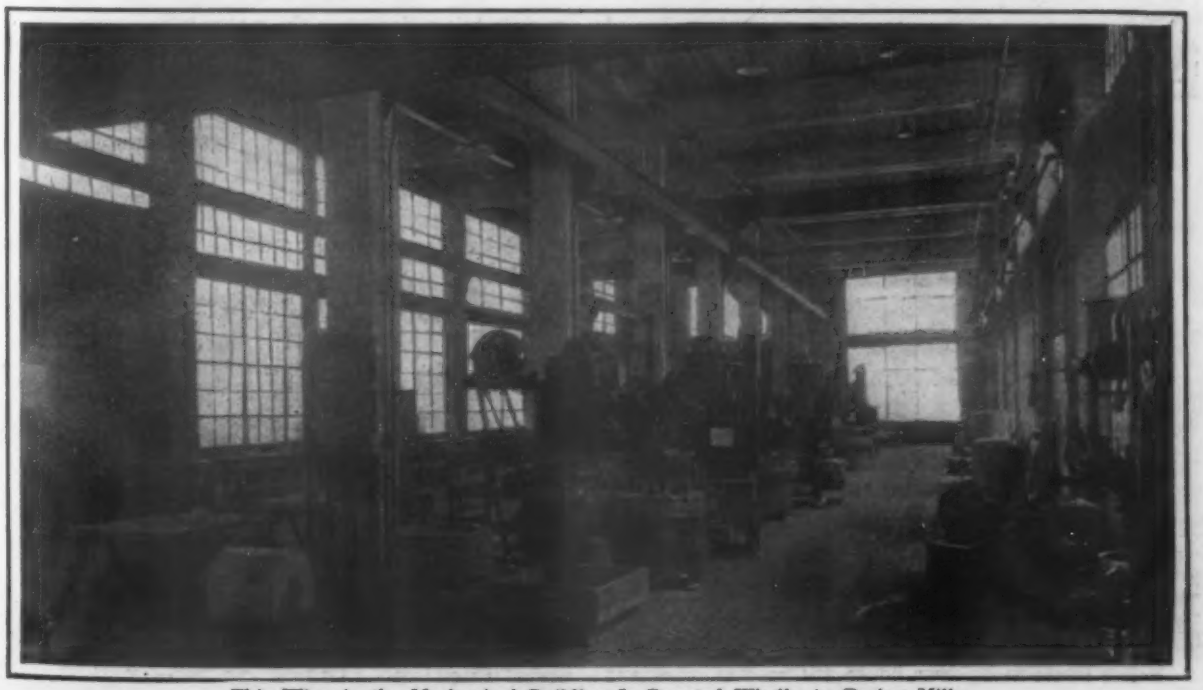
by the Babcock & Wilcox Co., all other parts being made according to S. Diescher & Sons' designs. Brick work of boiler settings was carried out by George Allen & Sons Co. Sil-o-cel was used for insulating purposes, while Drake non-clinkering furnace blocks were used in the furnaces. Flat arches over combustion chambers are of special patented design.

All valves, inspection doors, soot blowers, superheaters and all piping are accessible from structural steel, grating floored, balconies and stairways, placed on several levels around each boiler, and so joined by bridges that all parts of boilers are within convenient reach for operation and repairs.

Forced draft for boilers is provided by steam turbine driven Sturtevant steel plate fans of sufficient capacity to take care of double the present installation when working at 200 per cent of rating. Forced draft, from fans, is conducted through concrete chamber with damper connection at each boiler, and so arranged, and equipped, with air locks that inspection may be made at any time by entering this duct even while under pressure. Through this provision blast gates may be repaired, or replaced, without shutting off draft from chamber, or in any manner interfering with the full operation of boilers in service.

Boiler feed pump capacity has been provided in liberal excess, there being two 18 x 30 x 16 x 24 in. Epping-Carpenter steam pumps installed in projecting wing of boiler house. This wing also contains Epping-Carpenter pumps for operation of the water sealed dump gates of boiler ash hoppers. Feed water is heated by exhaust steam from boiler and pump house auxiliaries, in connection with large sized Hoppes feed water heater, and is metered so that accurate records may be secured.

Brick lined steel plate breechings and flues connect the boilers to the two Custodius radial brick stacks, each 14 ft. inside diameter at top, and 250 ft. high above boiler room floor level. Each stack sets upon a concrete foundation, about 40 ft. in diameter, extended down below the water tunnels passing by. Stack foundations are tunneled so that ash tunnels under boilers may continue in a straight line, in event that boiler house is extended. Accumulation in stacks is removed



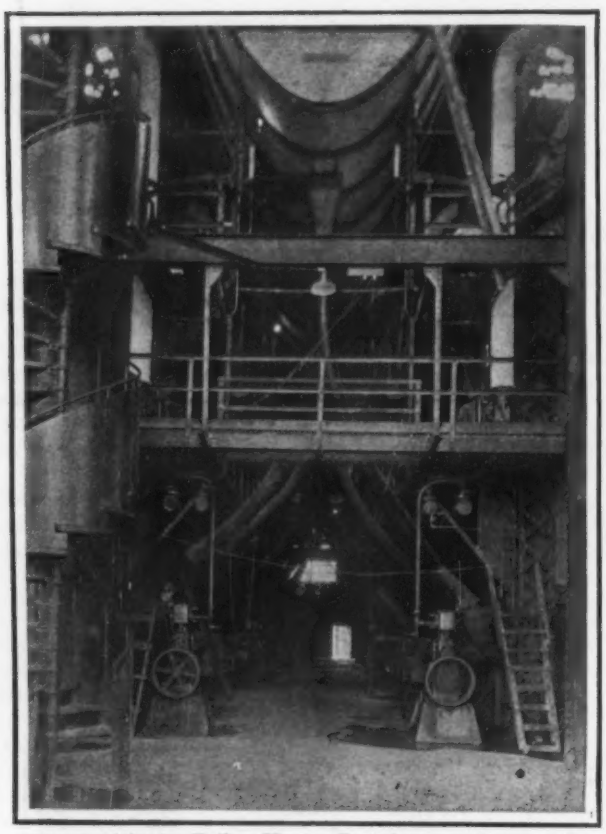
This Wing in the Mechanical Building Is Devoted Wholly to Boring Mills

by opening gates at the bottom of stack hoppers, and permitting the dust, etc., to drop into the ash cars, which convey it to ash waste pit.

Coal is received in standard drop bottom cars and dumped direct into the concrete coal basin, which has a capacity of about 7000 tons. Concrete bottom of coal receiving basin is located some distance below the normal water level of Potomac River, and the basin is so connected with the river that coal may be stored under water if desired. Connection between coal basin and river is controlled by sluice gates and valves, which make it permissible to enter water from the river, or drain from coal basin to river. Basin may also be flooded in event of fire.

Coal is passed from this basin by a Browning locomotive crane and Blaw-Knox clamshell bucket into Heyl & Patterson traveling coal crusher. Crusher, in turn, discharges through slot in tunnel roof onto conveyor belt below. This belt delivers coal to elevator, which conveys it to the overhead coal bunker above center aisle of boiler room.

A traveling coal crusher is installed above conveyor belt tunnel, which extends the full length of boiler house and beyond for short distance. This tunnel has a continuous slot in roof, protected against weather by folding gates. Coal crusher, as well as truck upon which it is mounted, is electrically driven. This arrangement makes it possible to handle coal from basin to crusher with utmost speed, since the crusher can at all times maintain its relative distance from the locomotive crane.



Firing Aisle in Boiler House Contains, as Always, the Stoker Engines, Overhead Coal Bunker and Chutes. Protected stairs at left give easy access above

A pit, containing coal elevator boot and hopper into which gathering belt discharges, is located along tunnel just mentioned. An emergency collapsing elevator is provided in the coal basin immediately adjacent to this receiving hopper, in such manner that, in event of breakdown in crusher or crane equipment, slack, or crushed coal, can be conveyed immediately from coal pocket into elevator boot. Hopper is also provided with an auxiliary chute, whereby crushed coal can be returned to the coal basin, adjacent to the emergency coal elevator, so as to be available in event of such breakdown.

Overhead coal bunker, above firing aisle of boiler room, is of Brown-Hoist construction, with concrete inclosed bracing members. Coal is distributed in bin by shuttle conveyor above, so designed and arranged that it can take care of double the present bunker length, without alterations. Aside from locomotive crane, all coal handling equipment is motor driven. Controls are all interlocked in such manner that breakdown or stoppage of any drive will automatically stop the entire coal handling system, thereby avoiding damage through jambing.

From coal bunker coal passes to each stoker receiving hopper, through two 12-in. pipe chutes, each equipped with weigh meter and chain-operated gate at hopper end.

Ample storage space is available in boiler house basement for tubes and refractories. Office, toilet and locker rooms and shower baths are provided for the employees. Every attention has been given to the comfort, safety and general welfare of those engaged in and about the plant.

The electrical power plant equipment at present consists of two 5000-kw. General Electric turbo generators, 3600 r.p.m., with their auxiliaries; also two 1000-kw. motor generator sets. Excitation units consist of one 100-kw. motor generator set and one 300-kw. turbo generator set, which can also be utilized for night lighting and elevator service, when plant is not operating 24-hr. per day.

The 5000-kw. units generate at 2300 volts, 60 cycle, 3 phase. Turbo generator units are all provided with quick stop valves, which can be tripped from remote points if desired. Motor generator sets take care of three-wire system, for variable speed motor operation and calender drives, 115 and 230 volts direct current.

Condensing equipment for the two 5000-kw. units is in the basement, with exception of the vacuum pumps. Condensing apparatus consists of two large surface condensers with their circulating pumps, condensate pumps and rotating dry vacuum pumps, all furnished by the Wheeler Condenser & Engineering Co.

Circulating pumps take water from tunnel below power house floor, pass it through condensers and down into discharge tunnel under basement floor at rear of condensers. All condenser auxiliaries are so cross-connected that they can be utilized on either, or both, condensers. Condenser hot wells have high water alarms and other devices which will automatically shut down the vacuum pumps, in event of excessive water, before any damage can be done to the pump.

Westinghouse switchboard is installed on the floor of power house, balcony above it containing switches and rheostats, all of which are solenoid, operated from switchboard below. Breaker panels for motor generator sets are located advantageously to the sets. At same time, the equalizer switches are all located on pedestals adjacent to the motor generators. Voltage regulators are located on their own pedestals adjacent to the main switchboard.

The two 1000-kw. motor generator sets rest upon concrete foundations extending below basement floor, and are cored out, thus affording chambers for their transformers, etc.

All conductors within the power house, and extending over to switching station in main factory building, are of bare copper, so placed as to be properly safeguarded.

Switching station for main factory building is located in fireproof chamber below the building, and connected with power house by bus tunnel, protected at both ends with wire screens and doors. Busses extend, through this tunnel, from power house switchboard.

Fabricated pipe, valves, fittings, etc., for the entire installation were furnished by Crane Co., Chicago, all of this piping material being ordered according to engineers' detailed drawings. Piping was erected by Riggs, Distler & Stringer Co., Baltimore, and, due to the shop work of the Crane Co., was assembled with field expense at a minimum.

The piping material included numerous special fittings, with supporting legs to rest on concrete piers, or with flanges for attachment to steel work, where otherwise several standard fittings combined would

Pattern Shop, in Second Story of the Mechanical Building. The fire doors, in rear, open into the fireproof pattern storage

have been necessary to accomplish the same results. Condensation, accumulated at separators, waterlegs and drips, is returned to boilers by Holly gravity return system.

Piping includes high and low pressure lines for steam, service water, water for fire protection, hydraulic lines of 300 and 2000 lb. pressure, compressed air lines, and low-pressure heating lines, the maze of pipe and cable often found in basements of industrial plants being avoided by resorting to the tunnels and conduits referred to. With the exception of a few of the smaller pipes, all lines are placed in trench, below basement floor, extending the full length of the main building and covered with floor plates. With this arrangement, leakage, or water from breaks in the piping, will drain through the trenches, and the floor plates give ready access for repairs. All high pressure hydraulic lines are safeguarded at strategetic points by installation of Crane hydraulic relief valves and shock absorbers.

The pump house is a steel frame, brick inclosed building, about 75 by 160 ft., and houses all plant service and fire pumps, air compressors and high-pressure hydraulic pumps with their accumulators. The Allis-Chalmers pumping engine, emergency centrifugal pump and the fire pumps are located on the lower level, while the balance of the equipment is on upper level, all accessible to 20-ton Shaw overhead traveling crane. Ample space is provided for more than double the present equipment, without extension to building.

Water is conducted to pump house through underground tunnel, about 50 sq. ft. in cross sectional area, joining with water tunnel of power house a short distance from the intake house. Adjacent to this connecting point, sluice gate chambers are provided to afford full control, or shut off, for cleaning tunnels, extension or for other reasons. Water enters pump house suction pit through traveling vertical screens of fine mesh, and thence into suction pit, extending entirely across the pump house, and with side walls extending high enough above basement floor to afford protection against high stage of water in river.

Suction pit is covered with grating floor, and has a depth equal to elevation of the river bottom. Drawing from this suction pit at present there is one Allis-Chalmers compound condensing pumping engine, of about 6,000,000-gal. capacity, with space provided for a second similar unit; motor driven centrifugal pump, for emergency use, of about 4,000,000-gal. capacity and also two Worthington Underwriters' fire pumps, each of 1500-gal. per min. capacity. Service and centrifugal pumps both deliver output to 25 x 115 ft. standpipe in yard adjacent to pump house. Drinking water, at present, is taken from the city water mains, and is piped

Hydraulically Operated Ash Gates, in the Ash Tunnel in Basements, Are Operated by Valves Mounted on Concrete Pads Along Wall at Right

in such manner that refrigerating unit may be connected at a later date.

High pressure hydraulic pumps, for plant service, of 300 and 2000 lb. per sq. in., are located on upper lever of pump house. These are of Worthington Epping-Carpenter make, while the accumulators were manufactured by the Wellman-Seaver-Morgan Co. The main hydraulic pumps are each 18 x 30 x 5 x 24 in., while the accumulators are 12 in. ram and 12 ft. stroke, provision being made for additional units as required. Low pressure hydraulic pumps, 300 lb. pressure, are also Worthington Epping-Carpenter make, 14 x 20 x 10 x 16 in. High pressure hydraulic pumps, pressures 300 to 2000 lb. per sq. in., are used in connection with tire vulcanization, and are supplied from suction tank. Water is returned from presses to tank, and after passing through strainers goes to settling chamber. Water level is controlled by float, and all lost water is replaced with the distilled water from power plant condenser.

Upper level of pump house also contains two 15 x 27 x 27 x 15½ x 24 in. Laidlaw air compressors, furnished by the Worthington Pump Co., with the usual after-coolers, air tanks, etc.

All water pumps, with exception of boiler feed and high pressure hydraulic pumps, are so connected that they may be utilized for fire fighting as well as for plant service. All discharge piping from the various fire pumps, service pumps and city water are bypassed, in basement of pump house, at a common point, thereby placing control, for fire fighting purposes, at a convenient point.

Mechanical building, adjoining pump house, is of same type of construction as main building and has been built with a view of adding additional stories later on. This building, with ground area of about 130 x 160 ft., is at present two stories and basement, with a mezzanine floor over part of the area. This department is provided with the necessary machinery to make all cores and molds required for the manufacture of tires, as well as to do all machine work in connection with maintenance and repair of the mill machinery. The building also contains blacksmith shop, tool-making department, pattern making shop, tin shop, and experimental machinery development.

Fireproof stair tower was provided in southwest corner of mechanical building, and extended above roof. High speed freight elevator, with platform about 8 x 17 ft., establishes freight communication between the different floor levels. This building is connected with pump house, power house and main factory building by a system of tunnels devoted entirely to traffic, pipe and electric cables having their own individual tunnels. These tunnels, all about 12 ft. in width and 10 ft. in height, afford ample facilities for storage battery truck traffic between departments. One of them extends for the full length of the main factory building, passing under the north end of each wing, thereby making it possible to transport repair parts between all floors of the machine shop, and any floor of the factory building, pump house or power house, and without in any manner interfering with the process traffic of plant.

The mechanical department was completed and placed in operation shortly after work commenced on the balance of the plant, and temporary power connections made with the adjoining public service plant of the Edison Co. This department was then devoted to the making of machinery and other equipment for the main factory building as well as carrying out the many forging and machining jobs incidental to main plant construction.

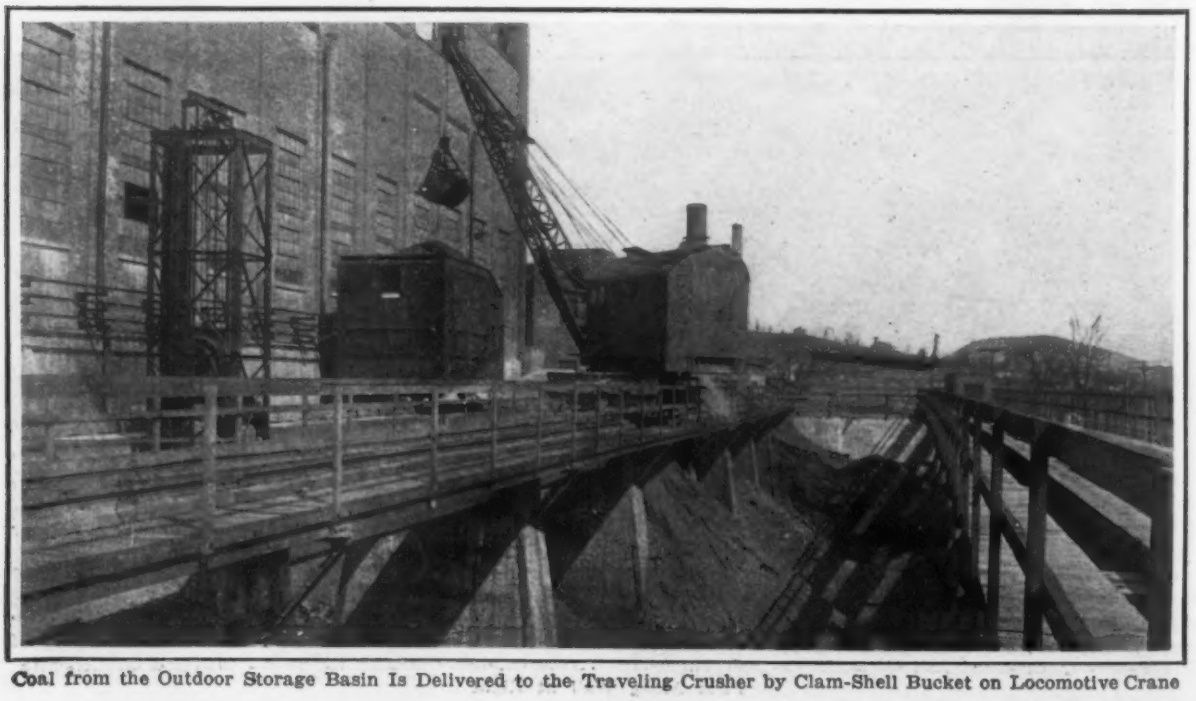
Employment office and temporary hospital are housed in the small one-story building to the right of main factory building. This covers a ground area of about 52 x 136 ft., and is divided by a wide center hall extending from end to end. Rooms on one side of the hall are devoted to employment offices, while those on the other side were planned to serve as temporary hospital quarters, including among other facilities, first aid room, dental room, rest room and a fully equipped operating room, with all usual appurtenances.

To the right of this building is the laboratory, covering an area of about 53 x 300 ft. The two-story section of this building is devoted to physical and chemical research, as related to the rubber industry. The one-story section, to the rear, is devoted to experimental tire making, the equipment being on the same large scale as found in the main rubber factory, all experiments and research being conducted on tires in full commercial sizes.

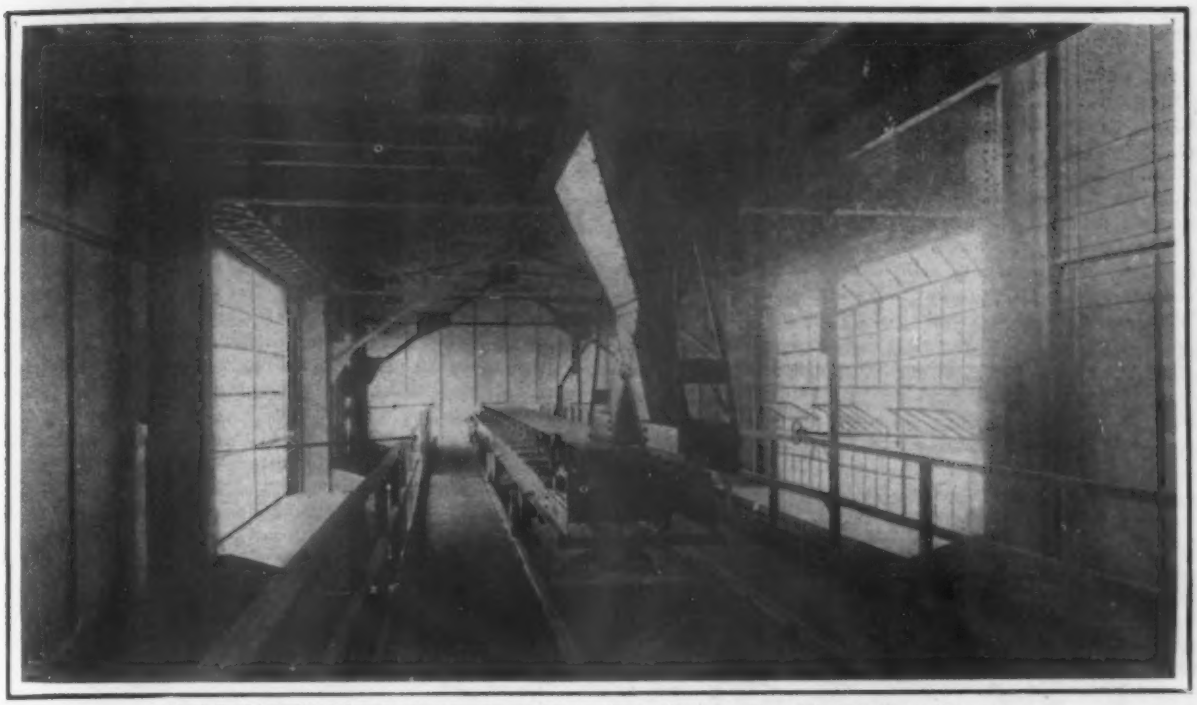
The entire laboratory and experimental building is of fireproof construction, there being no woodwork except a few exterior doors. All sash are of steel, while the window sills are all of Alberene stone. Laboratory furniture and fixtures, such as tables, hoods, vents, etc., are all of stoneware.

Back of laboratory is the garage, with its machine and repair shops and car storage. This is a two-story fireproof structure of brick inclosed steel, and measures about 66 x 150 ft. The first floor is devoted entirely to the storage of the company's trucks, and test cars, and the machine shop for maintaining them in proper condition and repair. Second story, reached by ramp on outside of building, is devoted to the storage of cars of employees.

The main factory building lies east and west, the head house being 760 ft. long and 120 ft. wide. From the north side, four wings extend to a length of 430 ft.,



Coal from the Outdoor Storage Basin Is Delivered to the Traveling Crusher by Clam-Shell Bucket on Locomotive Crane



Coal Is Distributed into the Bunkers Above the Boilers by This Shuttle Type Conveyor

to which length may be added as needed. Three of these wings are 60 ft. wide, while the fourth has a width of 200 ft. All are separated by courts 80 ft. wide, connected at north ends by bridges at all floors; the basements being connected by tunnels. The 200 ft. wide wing is divided into two 60-ft. wings above the first floor, with an 80-ft. light court between.

Fourteen stair and elevator towers at ends of wings are all of brick and concrete construction, with steel and iron stairs, and have automatic fire doors on all interior openings. Safety doors leading to yard and courts are also provided. Standpipes, with fire hose, are provided in all stair towers. Each stair tower in the main building houses stairway, wire shafts, elevators and toilet room. Elevator platforms are all about 8 x 17 ft., of about 10,000 lb. capacity. A duplication of the present wings on the south side of the main aisle, making the entire structure symmetrical on the center line, would add twelve towers, making the total twenty-six. All stair towers extend from the basement to a sufficient height above the roof to provide a convenient means of exit from the stairway.

The present structure is designed to be increased later on to a height of four or five stories, without interfering with manufacturing operations. The roof is formed, on the third floor beams, which are in place, of 3 x 4 in. surfaced yellow pine on edge, a size that can be easily warped to conform to the position of the purlins. Columns extend through the roof, with splice, for the next column section, protected by brick inclosure with flashing carried over the top. A cut stone cap gives further protection.

The basement floor is of concrete. The first, mezzanine, and second floors are of the packed or laminated type, 2 x 10 in. surfaced yellow pine being used throughout. The span between floor beam centers is 20 ft. These floors were designed to carry 360 lb. per sq. ft. Factory buildings were planned with a viewpoint of securing maximum daylight in all departments, and, in addition to steel sash, large areas of saw tooth monitor roofs are provided.

S. Diescher & Sons, Pittsburgh, were the designing and supervising engineers, who prepared plans and specifications and supervised the construction. Edward Necarsulmer, 507 Fifth Avenue, New York, was consulting architect.

Athol Machine Co. Readjusts Line

The Athol Machine Co., Athol, Mass., vises, announces a readjustment of its entire line. The company has spent approximately two years in this work and in bringing its plant up to a higher degree of efficiency. When the present management took charge the normal output was 60 to 70 vises per day. To-day the plant, in full operation, is capable of producing 250 vises per day with no increase in the number of employees.

Plant equipment has undergone a radical change. All original jigs and fixtures have been practically discarded and new quick-acting tools substituted. A very large percentage of the original metal-working equipment was classified as obsolete and discarded. The balance, together with latest designed machine tools, is rearranged in sequence according to machining operations, and the product is redesigned so that all working parts of any given size vise are interchangeable. Production operations thereby are simplified. Latest design cutting tools, as well as a modern tool crib have been added, and a special tempering department installed. A system whereby sales automatically govern plant output as well as the purchase of raw materials, and an effective cost system are among the many reforms.

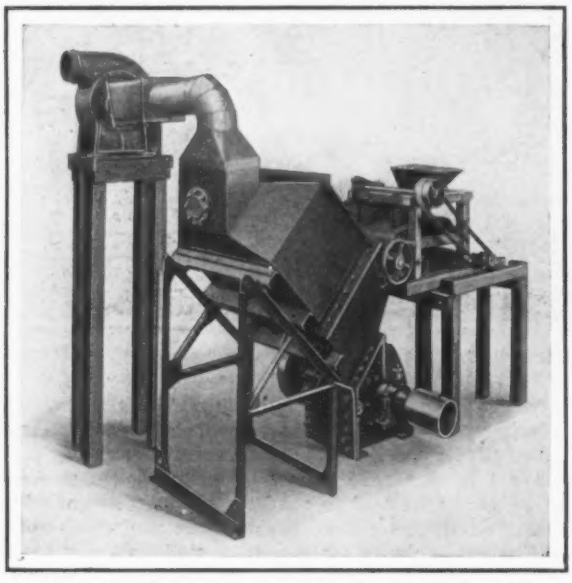
In the foundry, machine-made molds have replaced hand. A new method of mounting patterns makes possible the welding of steel jaw faces to the cast iron during molding operations. The company has developed a molding sand deposit within its property.

H. R. Linton, general manager, secretary and treasurer, is responsible for plant and product improvements. Mr. Linton's connection with manufacturing began with the Means Foundry & Machinery Co., Steubenville, Ohio, with which he was associated more than eight years, most of the time as secretary and general manager. From here he became general manager Centre Foundry & Machine Co., Wheeling, W. Va., remaining two years. During the following three years Mr. Linton was engaged in special work dealing with manufacturing plants, and for the four years prior to going with the Athol Machine Co. was with the Ohio Valley Clay Co., Steubenville. At Athol, he has been ably assisted by Mervin Kessler, general superintendent. Mr. Kessler began his mechanical career with the Model Gas Engine Co., Peru, Ind. During the war he was associated with the Westinghouse Electric & Mfg. Co., first in Pittsburgh, and subsequently in Springfield, Mass., his work here being in connection with 8-in. shells and machine guns.

Powdered Coal Preparing Machine

An addition to the list of powdered coal apparatus is the new machine shown in the accompanying illustration, developed recently by the K-B Pulverizer Co., Inc., New York. It is called the Pulverburner and the advantages claimed for it are compactness, close regulation of fineness and air, economy and adaptability to small as well as large installations.

The essential features of the machine are the pulverizing mechanism and the air separating chamber. Feeding is by an automatic feeder of the belt type. The pulverizing is accomplished by means of six rapidly



The Velocity of the Air Through the Separating Chamber Determines the Fineness of the Product

revolving hinged beaters which smash the coal against breaking blocks and then against grinding plates in the bottom of the machine. The pulverized material is discharged by centrifugal force directly into a large separating chamber. An exhaust fan, in the discharge duct leading from the separating chamber, induces air at slow velocity through the chamber, removing the fine coal and allowing the oversize to return to the machine for further pulverization, the velocity of the air through the separating chamber determining the fineness of the product. From the separating chamber, the fine dust is drawn through the fan and blown directly into the furnace. Secondary air is added at the nozzle. By using "splitters" the stream of coal and air can be distributed to several nozzles, enabling one machine to serve several furnaces.

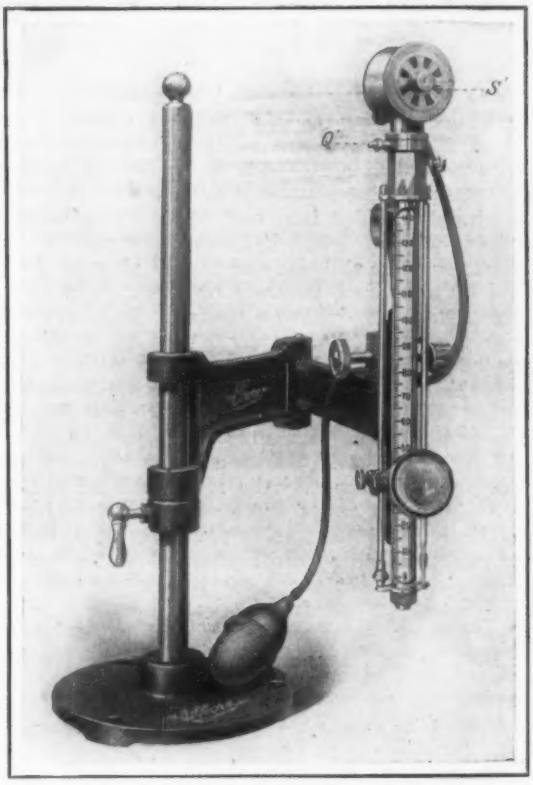
By combining impact pulverization with air separation the "fines" are removed from the machine as rapidly as produced so that the beaters are always operating on coarse material. This, it is pointed out, is an important item of power saving. Coal that has not been dried can be successfully handled in this type of mill, it is claimed, and because of the air separator, there are no screens to clog. Close regulation is a feature. The rate at which the coal is fed is controlled by the automatic feeder by means of a cam arrangement that varies the speed of the belt. The coal should be fed in such a size that a uniform ribbon is formed on the belt. Coal of 1 in. and under is satisfactory. A magnetic pulley can be used with the feeder to prevent tramp iron from entering the machine. Quantity of air is controlled either by the speed of the fan, if a variable speed motor be used, or by a damper in the discharge passage. Air is introduced around the shaft. Velocity of the air through the separating chamber is regulated by two vanes in the chamber controlled through a worm and wheel. The beaters can be extended radially outward as they wear. The entire controlling mechanism can be operated by an automatic regulator.

The apparatus is designed to be driven by either one, two or three motors. If one motor is used both fan and feeder are driven from the pulverizer shaft. It is sometimes desirable to drive the fan from a separate motor, likewise the feeder. The machines are built in a range of standard sizes, in capacities up to 3 tons per hour.

The Improved Shore Scleroscope

The demands made on the Shore scleroscope recently have been so intensive and often under such adverse conditions that its manufacturers have made a closer study of the advanced conditions of its application with view to further improving it. The results are announced as satisfactory. As a result the scleroscope, formerly known as Model C, has been listed as Model C-1, as described in Bulletin No. 20, issued by the Shore Instrument & Mfg. Co., Jamaica, N. Y. The refinements made are said to so increase the flexibility of the operating mechanism that it will give more uniform service even though the adjustments are comparatively approximate and the working conditions, including the skill of the operator, less favorable.

Among the features as shown by the illustration are: A special fine screen S, for eliminating dust from the operating mechanism; the leather operating piston, formerly used, has been replaced by one of tungsten steel, which is practically indestructible; the former



The Improved Shore Scleroscope, Model C-1

rigid adjustment of the hammer hook mechanism has been replaced by a flexible adjustment, Q, which also greatly prolongs the life of the glass tube; the hammer hooks have been provided with shock shoulders, which eliminate breakage or non-alinement of these parts. More highly perfected glass tubing is being employed.

An order has been entered by the Interstate Commerce Commission requiring Railroad Director General James C. Davis as agent for the Elgin, Joliet & Eastern Railroad, to pay to the Illinois Steel Co., on or before Dec. 20, $59,320.32 as reparation on account of the unreasonable rate charged for the transportation in 1918 of 15,450 carloads of coke from ovens to various points within the area of the complainant's plant at Gary, Ind.

The Bristol Brass Corporation, Bristol, Conn., is operating its plant nine hours per day, five days a week, as against eight hours per day, three days a week, heretofore.

Composition of Pig Iron and of Cast Iron

Chemical and Structural Composition—Various Elements, Their Characteristics and Effect on the Metal—Oxygen in Iron

BY Y. A. DYER*

CHEMICALLY stated, pig iron is composed of 100 units of metallic and non-metallic elements. It is the product, or metallic residuum, obtained after having reduced iron oxide ore in a blast furnace. The quality of the product depends on the character of ores available, composition and structure of coke used for their reduction and melting; limestone for fluxing; general furnace working conditions, and furnace practice.

In any given cupola mixture, the metallic iron—pure iron or ferrite—automatically adjusts itself to conditions, but the carbon ratio (graphitic to combined) is the final factor of adjustment to be "juggled" by the melter and mixer to produce the desired structural composition. Therefore, to produce a casting of maximum strength, it becomes self evident that, inasmuch as the chemical composition of pig iron has to be relied on as the prime factor in computing the total chemical mixture to be obtained from a given pig iron and given scrap, the matter of choosing an iron with as desirable chemical constitution as possible is paramount. To know the effect of the metallic and non-metallic alloys (manganese, silicon, sulphur, phosphorus) on the carbon is also of prime importance.

Structurally stated, pig iron is a composite aggregate of small crystalline metallic and non-metallic grains and flakes, cemented together with thin films of materials composed of ferrite (pure iron) and pearlite (iron, carbon and manganese in combination) embedded in the matrix or mass of metal or iron. The cementing material is stronger and tougher than the metal grains and flakes. Therefore, the structural properties creating strength and hardness in cast iron will depend on the nature of the substances embedded in the matrix.

In addition to the presence of 92 to 93 per cent of metallic iron as reported in pig iron there is also present from 7 to 8 per cent of metallic and non-metallic elements alloyed with it, and they have their peculiar effect on the general structure of the metal. These commonly referred to "impurities" are known as carbon, silicon, sulphur, phosphorus and manganese. Their characteristics and functions are described in the order named:

Carbon

The structure of cast iron differs as the ratio of its carbon constituency. That is: the degree to which its matrix is weakened by carbon graphitization, or strengthened by combined carbon, or carbon entering into combination with iron and manganese as a double carbide. In addition to carbon being the prime factor which controls the ultimate characteristics of gray and white irons, it also controls their melting-point and freezing-point. That is: the higher the graphitic carbon in iron the higher will be its melting point; the higher the combined carbon the lower will be the melting point. This fact is illustrative of the eutectic, or melting point of cast iron. The element carbon is associated with pig iron in two forms: definite carbon, commonly referred to as combined carbon and technically known as "cementite (Fe_3C)"; elemental or free carbon, commonly known as graphitic or pure carbon. Another form, technically known as "temper" or amorphous carbon, is present in malleable iron.

Combined carbon in gray iron is distributed throughout the metal in the form of very small particles of cementite—a mixture of iron and carbon (iron carbide) and manganese and carbon (manganese carbide). The remainder of the iron which is not contained in the cementite will exist in the free state, or as ferrite. Cementite is extremely hard and brittle. It contains, when pure, 93.33 per cent iron and 6.67 per cent carbon; has specific gravity of 7.24 to 7.74, according to Howe. The brittleness and hardness of white iron is due to the very large proportion of free cementite present. The cementite and ferrite are associated in mechanical mixture known as "pearlite" (Iron-cementite eutectoid) in the ratio of approximately 1:7 when perfect, or when the matrix of the metal contains pearlite only. That is: the eutectoid is perfect when its constituents are present exactly in this ratio—which is equivalent to 87.5 per cent iron and 12.5 per cent iron carbide, or combined carbon in the case of pig iron.

However, this mechanical "pearlitic" mixture is impossible in either gray or white iron, as will be noted from structural analyses given later. The cementite or ferrite present in excess of the ratio of 1:7 will exist in the free state. Therefore, cast iron containing less than 0.80 per cent combined carbon is said to have a hypo-eutectoid matrix. That is: its matrix will contain pearlite and free, or excess ferrite.

If cast iron contains more than 0.80 per cent combined carbon it is said to have a hyper-eutectoid matrix. That is: its matrix will contain pearlite and free cementite. The specific gravity of pearlite ranges from 7.82 to 7.84 and hardness 199 to 207, according to Howe. Therefore, it would appear that the strength of cast iron must be looked for in the quantity of combined carbon present and its constituency; and the nearer it approaches a true pearlitic structure (99.20 per cent iron and 0.80 per cent carbon) the more ideal its proportions; that is—when the combined carbon is near 0.80 per cent and the graphitic carbon as low as consistent with physical factors.

Distribution of Graphitic Carbon

Graphitic carbon in gray iron is distributed throughout the metal in the form of large and small flakes entirely free from chemical solution with either the iron or its carbides. Graphite contains 100 per cent carbon and has sp. gr. of 2.25. Its melting point has not been determined. Carbon in this form in cast iron largely differentiates the metallic matrix of the metal from that of steel. The graphite flakes weaken cast iron by reason of creating cleavage planes, therefore the extent to which they weaken the metal depends on their size and distribution. That is: if they should be disseminated throughout the metal in comparatively large and thin layers, more or less isolated, maximum weakness will occur; if the flakes should be smaller and held together in more or less compact mass the strength will be raised. This latter condition may be facilitated by the selection of irons well balanced in constituent elements, and by rational cupola practice.

It is within the scope of foundry practice to control graphitization of iron on remelt to suit conditions. The proportions of graphitic and combined carbon in pig iron vary. Their control is largely dependent on blast furnace temperatures, working conditions, slag and rate of cooling. High hearth temperatures and basic (limey) slag favor the reduction of silicon from the silica of the gangue. Silicon favors the formation of graphitic carbon, but tends to decrease the absorption of (total) carbon. Manganese favors the decrease of graphitic carbon and promotes the absorption of (total) carbon. Sulphur favors the decrease of graphitic carbon. The quicker iron is cooled, the higher will be its combined carbon.

Total carbon is the sum of graphitic and combined

*Birmingham, Ala.

carbons. To produce maximum strength in cast iron it should be the aim of mixer and melter to approximate 0.80 per cent combined carbon, then reduce the graphitic carbon by lowering the total carbon. In cupola melting this may be accomplished by the use of steel scrap added to mixtures. In this manner the graphitic carbon may be lowered to approximately 2.00 to 2.20 per cent, thus creating total carbon of 2.80 to 3.00 per cent. Total carbon may also be lowered by oxidation in air furnace, open-hearth or electric furnace. By lowering the total carbon a stronger and tougher cast iron or semi-steel may be produced.

While there is no fast set rule to serve as a guide, it should be expected that the total carbon in silvery, ordinary high silicon and low silicon irons would range from 3.00 per cent in silvery to 3.85 per cent in low silicon irons, in approximately the following manner with reference to silicon content:

Silicon	Total Carbon	Silicon	Total Carbon
1.25	3.85	2.75	3.50
1.50	3.80	3.00	3.40
1.75	3.75	3.25	3.30
2.00	3.70	3.50	3.25
2.25	3.65	4.50	3.15
2.50	3.60	5.50	3.00

However, there are exceptions to this arrangement of total carbon based on silicon content of the iron, as will be noted by following analyses of two Alabama irons:

	Silicon	Sulphur	Phosphorus	Manganese	Total Carbon
No. 1....	1.40	0.026	0.85	0.30	3.46
	2.40	0.020	0.85	0.30	3.65
	2.85	0.015	0.85	0.30	3.70
No. 2....	1.75	0.050	0.60	1.50	3.80
	2.25	0.038	0.60	1.50	3.75
	2.75	0.026	0.60	1.50	3.65

Therefore, it would seem that the foundryman should be entitled to receive from the furnace companies shipping him iron the percentages of graphitic and combined carbon along with other constituent elements. He will then be able to figure more intelligently on total carbon content in castings.

To attain maximum strength a casting should be well balanced in its carbon constituency, approximately as follows:

	Graphitic Carbon	Combined Carbon	Total Carbon
Gray iron	2.80	0.70 to 0.80	3.50 to 3.60
Semi-steel	2.50	0.70 to 0.80	3.25 to 3.35

Silicon

The element silicon has a very important effect on the ultimate constituency of cast iron. It is alloyed with cast iron dissolved in the ferrite; also in combination with iron. In the latter form it is known as iron silicide (FeSi). According to atomic weights of iron (56) and silicon (28) the silicon present produces (28:56=1:2) 3 times its own weight of iron silicide. Therefore, an iron with 1.50 per cent silicon will contain (1.50 x 3) 4.50 per cent silicide dissolved in its ferrite. Silicon exerts an important effect on carbon—largely determining its graphitic content. High silicon increases graphite, thus reducing strength and tending to brittleness. Foundry grades of pig iron usually range from 1.75 to 3.50 per cent silicon; forge irons as low as 0.75 per cent. With other elements well balanced, and consistent with machinability, the maximum strength of a casting will be reached with silicon approximately as follows:

	Per Cent Silicon
Gray iron	1.50 to 1.75
Semi-steel	1.15 to 1.35

Sulphur

By reason of the extreme affinity of manganese for sulphur these two elements readily combine and form manganese sulphide (MnS). According to atomic weights of manganese (55) and sulphur (32) the sulphur present produces (32:55=1:1.7) 2.7 times its own weight of manganese sulphide. Therefore, an iron with 0.06 per cent sulphur will contain (2.7 x 0.06) 0.162 per cent manganese sulphide. The sulphide has a melting point of 2948 deg. Fahr. Thus its splendid chance for segregation will be at once noted.

If the manganese present should be insufficient to combine with all the sulphur, the balance of sulphur will unite with the iron as iron sulphide (FeS). Howe gives eutectic of 7 per cent MnS plus 93 per cent FeS as 2160 deg. Fahr., and the melting point of FeS as 2140 to 2170 deg. Fahr. There is less chance for segregation by either of these sulphides on account of low melting points.

Sulphur favors the formation of combined carbon. While generally looked upon by foundrymen as highly detrimental, it would, therefore, seem no great bar to the production of strong castings if held within rational limits. Foundry grades of pig iron usually carry from 0.02 to 0.06 per cent sulphur; forge irons from 0.08 to 0.15 per cent. For light castings the sulphur should be kept within 0.05 to 0.07 per cent; medium castings 0.06 to 0.08 per cent. For heavy castings 0.09 to 0.12 per cent will not materially interfere. For carwheels, crusher parts, etc., 0.10 to 0.13 per cent is permissible. Maximum strength castings will show following approximate sulphur:

	Per Cent Sulphur
Gray iron	0.06 to 0.08
Semi-steel	0.06 to 0.09

Phosphorus

Phosphorus is present in cast iron as an iron phosphide (Fe_3P)—a conglomerate of iron and phosphorus containing 84.42 per cent iron and 15.58 per cent phosphorus, with specific gravity of 6.74. According to atomic weights of Fe_3 (3 x 56 equals 168) and P (31) the phosphorus present produces (31:168=1:5.4) 6.4 times its weight of iron phosphide. Therefore, an iron with 0.60 per cent phosphorus will contain (6.4 x 0.60) 3.84 per cent iron phosphide. The phosphorus in iron exerts no appreciable effect on the condition of the carbon, but it should be kept reasonably low from the fact that iron phosphide is likely to form segregation on account of its low freezing temperature (which is between 1800 and 1812 deg. Fahr. and tendency to seek walls of least resistance through which to exude and thus create globules and nodules.

Sometimes these globules are wholly separated from the metal matrix. Th author analyzed a specimen globule found segregated in a marine cylinder. The globule showed phosphorus 1.08 per cent, while the matrix of the metal analyzed 0.64 per cent phosphorus. The element phosphorus increases fluidity of metal by reason of the formation of a large quantity of fusible and fluid phosphide, therefore its presence is sometimes essential to aid fluidity in small and intricate work—but always at the sacrifice of strength. In large percentages it has a tendency to exclude carbon. Standard southern irons contain from 0.70 to 1.50 per cent phosphorus; a few special brands as low as 0.60 per cent phosphorus. Standard northern and eastern foundry irons contain from 0.40 to 0.80 per cent phosphorus—some special brands as low as 0.15 to 0.20 per cent phosphorus. With other elements rationally balanced maximum strength in castings will be shown when phosphorus content is approximately as follows:

	Per Cent Phosphorus
Gray iron	0.30 to 0.50
Semi-steel	0.20 to 0.40

Manganese

The manganese present first combines with sulphur, forming manganese sulphide (MnS), then combines with carbon to form manganese carbide (Mn_3C). In turn the manganese carbide unites with the iron carbide in the formation of constituent cemetite—the double carbide being known as iron-manganese carbide ($FeMn_3C$). The combining weights of manganese and sulphur have been mentioned. According to atomic weights of Mn_3 (165) and C (12) the carbon present produces (12:165=1:13.75) 14.75 times its own weight of manganese carbide. Therefore, an iron with 1.50 per cent manganese will contain (1.50 x 14.75) 22.12 per cent manganese carbide, excluding the percentage which forms with sulphur and oxygen present. Therefore, the element manganese is a very efficient desulphurizing agent.

Manganese also promotes deoxidation, forming manganese oxide (MnO) by combining with oxygen present and passing to the slag. The melting point of manganese is 2237 deg. Fahr.; that of iron-manganese carbide between 2350 and 2400 deg. Fahr. The carbide

is granular and hard. Pig irons deficient in manganese are generally "boosted" in the cupola by small charges of ferromanganese. However, it is preferable to use a pig iron which carries its own (inherent) manganese. With other elements rationally balanced, castings will show maximum strength by the presence of approximate manganese percentages:

	Per Cent Manganese
Gray iron	0.50 to 0.85
Semi-steel	0.70 to 1.25

Chemical and Structural Analyses of Iron

A comparison of the ultimate and proximate chemical analyses with structural analysis of iron will be of interest in studying the formation of cementite, pearlite and their relative bearing on the strength, toughness and hardness of cast iron. Following is comparison of a gray cast iron:

Ultimate Chemical Analysis		*Proximate Chemical Analysis*	
Graphitic carbon	2.70	Graphitic carbon	2.70
Combined carbon	0.70	Fe_3C	10.00
Manganese	0.60	Mn_3C	0.52
Silicon	1.75	FeSi	5.25
Sulphur	0.07	MnS	0.19
Phosphorus	0.40	Fe_3P	2.56
Fe	93.78	Fe	78.78
	100.00		100.00

Structurally, this iron contains (10.00 + .52) 10.52 per cent cementite, therefore the eutectoid matrix contains (10.52 x 8) 84.16 per cent pearlite, 2.70 per cent graphite and 13.14 per cent free ferrite; or 86.78 per cent iron, 10.52 per cent cementite and 2.70 per cent graphite as against true pearlitic structural composition of 87.5 per cent iron and 12.5 per cent cementite. Following is comparison of a white cast iron:

Ultimate Chemical Analysis		*Proximate Chemical Analysis*	
Graphitic carbon	0.03	Graphitic carbon	0.03
Combined carbon	3.17	Fe_3C	47.25
Manganese	0.50	Mn_3C	0.37
Silicon	0.70	FeSi	2.10
Sulphur	0.10	MnS	0.27
Phosphorus	0.50	Fe_3P	3.20
Fe	95.00	Fe	46.78
	100.00		100.00

Structurally, this iron contains (47.25 + 0.37) = 47.62 per cent cementite; therefore the eutectoid matrix contains

$\frac{800-120 \times 3.17}{7}$ 59.94 per cent pearlite, 0.03 per cent graphite and 40.03 per cent free cementite.

Oxygen

With humanly perfect cupola working conditions there will be a small quantity of oxygen absorbed by iron, usually in the form of ferrous oxide (FeO)—probably 0.01 to 0.02 per cent, as reported by Johnson. Exhaustive tests and research work carried on by Johnson have demonstrated that a small residual percentage is ever present, and may be intentionally increased to 0.07 per cent, or some higher. This small residuum of oxygen retained in combination by iron is probably representative of the scant capacity of metallic iron for stable constituent oxygen; for it is certain that not far beyond this narrow margin the oxygen has stronger inclination for synthetic action on the iron, or affinity for the carbon and manganese present.

The synthetic action may be described as a tendency of the oxygen to transform the metal back to its former natural state—iron oxide of brittle nature. Its strong affinity for carbon in the presence of heat causes it to combine readily with carbon in the iron to form carbon monoxide gas, which passes off as vapor if the metal remains liquid sufficiently long and venting of mold is good; otherwise the gas will be trapped and cause blowholes. That portion which unites with manganese usually passes to the slag as manganous (MnO) oxide, but if entrained in the metal may cause serious trouble. Therefore, it would seem that any beneficial results to be expected from constituent oxygen in iron must be looked for in the capacity of the metal to hold in combination, under strict equilibrium, the oxygen absorbed—otherwise the good effects may be destroyed by its excessively combining with iron under synthetic conditions and thereby causing detrimental reactions with the carbon.

In this connection, it should be borne in mind that iron oxide is very unstable and has a comparatively high melting point (2586 deg. Fahr.), thus will rarely be found dissolved in iron to any great extent; therefore, if segregated and entrained in the metal its high freezing point is likely to cause sponginess in castings. Sometimes it actually frees itself en masse, and mechanically carried with it particles of iron of lower freezing point to the top of liquid metal. As an illustration of this phenomenon on one occasion the author made a test of two heats by using several thousand pounds of a pig iron which had all the earmarks of being highly oxidized in the blast furnace.

Cupola conditions were checked closely and proved to be fairly ideal. The metal came down hot, was held for several minutes in a 12,000-lb. ladle and skimmed several times. However, scoria would quickly form on top of metal after each skimming. The iron was then transferred to small ladles, and by such process the agitation in pouring still further freed a large quantity of scoria, which in turn was skimmed while the metal was being poured in molds. This last agitation by pouring freed more scoria, which passed through the gate, through the mold and appeared on top of riser. The scoria from riser was analyzed, with following results:

Silica	17.4 per cent
Alumina	3.3 per cent
Lime	0.0 per cent
Iron oxide	16.0 per cent
Iron	60.0 per cent

Strictly speaking, this is not the analysis of a slag, inasmuch as no lime is present. The silica and alumina were doubtless gathered from the mold by mechanical attraction. The high melting point of iron oxide caused it to remain solid in the liquid metal of lower freezing temperature, and during its travel through the mold it mechanically carried much free iron. It was a spongy and gritty mass of considerable weight, due to the high percentage of iron. The large percentage of iron oxide tells the story—castings contained numerous blowholes and pinholes beneath the surface, and always on the cope side. A change in brand of pig iron effected a speedy remedy, and under identical cupola working conditions.

Much has been written, pro and con, in regard to the beneficial effects of constituent oxygen in cast iron, but the subject is yet far afield. It is a well established fact, however, that when iron has been oxygenated to considerable extent the metal takes on quite a different form—chemically and physically. Very hot metal becomes oxygenated rapidly when exposed to oxygen and assumes a hard and brittle nature—a principle well illustrated by the formation and expulsion of iron oxide scale on metal heated in a forge and hammered or rolled in the open.

Another illustration is the iron oxide film which is ever present on top of metal in a ladle, or on top of risers, sprues, etc. The iron globules which trickle down through the charges in a cupola are protected from complete oxidation by the film of oxide, or coating produced by the oxygen of the blast through which it passes on its descent to the hearth. The sparks seen flying from the cupola spout or agitated metal are due to small particles of iron being burned in the oxygen of the air. The meteorites are also burned in the oxygen of space. Numerous instances may be cited to substantiate the fact that heated metal is readily attacked by oxygen.

If, for any reason, the iron ore in a furnace should not be thoroughly deoxidized before it reaches the critical point of fusion, particles of iron oxide will be precipitated to the hearth and tapped with the metal; or if cast iron be subjected to undue oxidation, either during the melting process or by contact with constantly applied heat or acids, or constant exposure to moisture, then in either event on remelt in a cupola disastrous results will be reflected in the resultant metal—provided sufficient measures be not adopted for proper deoxidation—chiefly in the form of sluggish iron, blowholes, cold-shuts, etc.

Iron oxide scoria which is permitted to flow with

the metal from sprue or runner into gate will surely cause trouble, provided it does not pass through the mold and out at riser or shrink head without chemical reaction with the carbon in the iron. If entrained in the metal its oxygen will likely react with the carbon present (FeO+C=Fe+CO), thus forming carbon monoxide gas—a blowhole, or a series of them, will be the result if the gas does not escape. Its presence may be easily detected in company with flocculent masses of sand, graphite, etc., on top of pig iron after solidification—either sand or machine cast pig. If cupola metal should be unduly oxidized, similar spongy-like mass may be found freeing itself from the metal as it stands in the ladle, or on top of risers or shrink heads.

FERROMANGANESE SUPPLIES

Production at the Lowest Point on Record—Available Supplies—No Spiegeleisen Being Made

Although the decline in the pig iron output of the country, which culminated in July, has been the most severe in the history of the industry, the production of ferromanganese and spiegeleisen has fallen to levels lower by contrast than in the case of pig iron. In fact, so far as records go, production of both alloys is lower than at any time in the history of the industry.

From an average in the first quarter of this year of 19,178 tons per month the ferromanganese production has declined to an average of only 2892 tons per month in the third quarter, the culmination having been in July at 1509 tons. In 1913 the average output was 8280 tons per month and the height of the war period was 28,775 tons per month in 1918.

Production of spiegeleisen has ceased altogether, none having been made since July, with none in June and only 1197 tons in May. This contrasts with a monthly production in the first quarter of 11,667 tons per month.

The following table gives the output of ferromanganese and spiegeleisen for this year to November compared with previous periods:

Ferromanganese and Spiegeleisen Output in the United States in Gross Tons

	Ferro-manganese	Spiegel-eisen	Total	Aver. Per Mo.
First quarter, aver. per mo., 1921	19,178	11,667	.....	.....
April 1921	9,566	14,744	24,310	.....
May, 1921	3,339	1,197	9,232	.....
June, 1921	4,536	.....	4,536	.....
Second quarter, aver. per mo., 1921	5,814	5,314	.....	.....
July, 1921	1,509	4,015	5,524	.....
August, 1921	3,878	.....	3,878	.....
September, 1921	3,289	.....	3,289	.....
Third quarter, aver. per mo., 1921	2,892	1,338	.....	.....
October, 1921	3,902	.....	.....	.....
Total 1920	282,681	103,448	386,129	32,177
Total 1919	179,029	65,391	244,470	20,732
Total 1918	345,306	249,002	594,308	49,525
Total 1913	119,495	126,081	245,576	20,464

It will be seen that for the last three months the ferromanganese output has been under 4000 tons each month with no spiegeleisen made at all.

Available Supplies

The available supplies of ferromanganese for the first, second and third quarter of 1921 compared with other periods were as follows, as obtained from an analysis of the output, imports and exports:

	Output	Imports	Exports	Available Supply
First quarter, aver. per mo., 1921	19,178	917	60	20,035
Second quarter, aver. per mo., 1921	5,814	818	73	6,559
Third quarter, aver. per mo., 1921	2,892	466	68	3,290
Aver. per mo., 1920	23 557	4,938	288	28,123
Aver. per mo., 1919	14,923	2,752	255	17,420
Aver. per mo., 1918	28,775	2,264	298	30,741
Aver. per mo., 1917	21,486	3,703	776*	25,413
Aver. per mo., 1916	17,365	7,577	...	.....
Aver. per mo., 1915	12,021	4 605	...	.....
Aver. per mo., 1913	9,958	10,672	...	.....
5-year aver. (1910-14)	8,280	8,399	...	.....

*First half only.

Available supplies for the third quarter had fallen to 3290 tons per month as contrasted with 20,035 tons per month in the first quarter. In 1920 these were 28,123 tons per month.

Imports of British ferromanganese have further declined to half what they were in the first quarter, having been only 466 tons per month in the third quarter as contrasted with 917 tons per month in the first quarter and 10,672 tons per month in 1913.

Exports of the American alloy are insignificant, having declined from 288 tons per month in 1920 to 68 tons per month in the third quarter of 1921.

Manganese Ore Imports

Manganese ore imports into this country had declined to 14,823 tons per month in the third quarter of 1921 from 60,944 tons per month in the first quarter of this year and 50,119 tons per month in 1920. There were 28,858 tons per month in 1913. Present and past imports are given in the following table:

Manganese Ore Imports in Gross Tons

	Total	Average Per Month
First quarter, 1921	182,832	60,944
Second quarter, 1921	119,092	39,697
Third quarter, 1921	44,469	14,823
Total, 1920	601,437	50,119
Total, 1919	332,344	27,779
Total, 1918	491,303	40,942
Total, 1917	629,972	52,498
Total, 1916	576,324	48,027
Total, 1915	320,784	26,732
Total, 1913	345,084	28,858

The present import rate is only about 50 per cent of what it was in 1913 and about one-third of the 1920 receipts.

British Supplies of Manganese Ore

In Great Britain there has been a sharper decline than in the United States in the receipts of manganese ore as shown by the following table:

British Imports of Manganese Ore in Gross Tons

	Total	Average Per Month
First quarter, 1921	104,492	34,830
Second quarter, 1921	37,546	12,515
Third quarter, 1921	14,559	4,853
Total, 1920	452,613	37,718
Total, 1919	265,800	22,150
Total, 1918	365,606	30,467
Total, 1917	331,264	27,605
Total, 1916	439,509	36,625
Total, 1915	377,324	31,443
Total, 1914	479,435	39,953
Total, 1913	601,177	50,098

The average imports for the third quarter of this year had fallen to only 4853 tons per month against receipts in 1913 of 50,098 tons per month and 37,718 tons per month in 1920.

Supplies and Needs in 1921

Not long after the United States entered the war it was officially estimated that the monthly needs of the steel industry were 28,000 tons of ferromanganese. This was based on the use of 80 per cent alloy and a steel output of about 43,000,000 gross tons. In THE IRON AGE of May 13, 1920, it was estimated that with a steel production of ingots and castings of 45,000,000 about 316,000 tons of ferromanganese would be theoretically necessary. The 1921 production of steel, based on official reports to November, will be about 21,000,000 gross tons. The ferromanganese production, based on the output thus far this year, will approximate 94,720 gross tons, while the imports will come close to 8000 tons, making the total available, exclusive of exports, about 102,720 tons. Theoretically a 21,000,000-ton steel output will require about 147,000 tons of ferromanganese. At the end of the year, therefore, there would be an apparent deficiency of about 43,000 tons. Supplies carried over from the heavy production in 1920 and early in 1921 are probably ample to cover this theoretical lack of alloy.

Magnetic Surveys of Railroad Rails

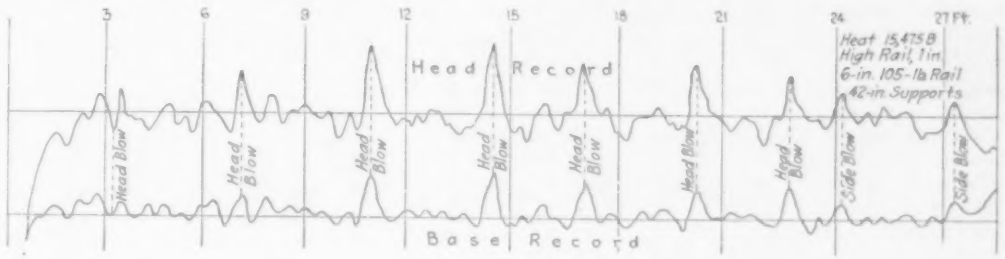
Determination of Fissures Obscured by Heavy Damage from Gagging Presses—Improvements Being Made in Section and in Straightening

SINCE the publication, two years ago, of the paper* by Dr. P. H. Dudley, before the American Society for Testing Materials, covering the results of his magnetic surveys on new and failed rails, his work has been carried forward in the New York Central shops at Harmon along the same lines as outlined in the paper. He reports, however, that very little of a new nature has since been discovered, most of the results being simply corroboration and duplication of facts previously established.

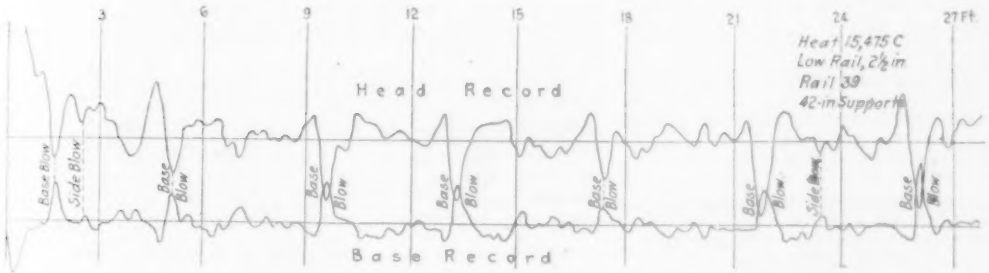
But it has been found possible by this means to distinguish between a ductile rail and one which is brittle, either because of its chemical composition or from the method of manufacture. The original idea of learning through these surveys something about the internal structure of the rail, particularly with regard to the presence or absence of fissures or of segregation of material chemically or through the effects of coalescence, is still under study. It is hoped that developments will make it possible to place dependence upon such a test.

While the effects might show up sharply in a rail which had not been straightened, the effect upon the rail of straining it beyond its elastic limit in the gag press, and thus producing a permanent set at various points along the length, so far overshadows, in its magnetic manifestations, lack of uniformity in the structure, as to mask the latter completely.

Some years ago it was common practice to support rails in the gag press upon centers 28 in. apart. At Dr. Dudley's insistence, the distance was lengthened to 42 in., with marked diminution of the number of rails which actually broke in process of straightening and of the number of failures in service caused primarily by gag press troubles. He is now advocating a distance of 60 in. between supports, and one of our illustrations shows the survey of a rail straightened in that way. All of the others are on the present standard of 42 in.

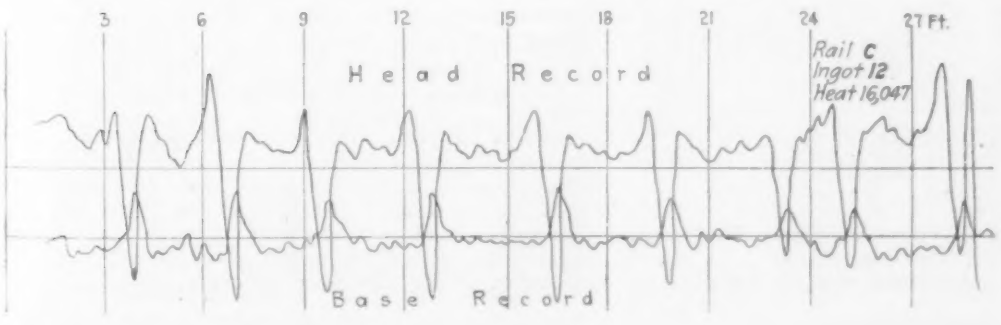


Magnetic Leakage Curves of a New Rail in Which Most of the Gag-Press Blows Were Delivered upon the Rail Head



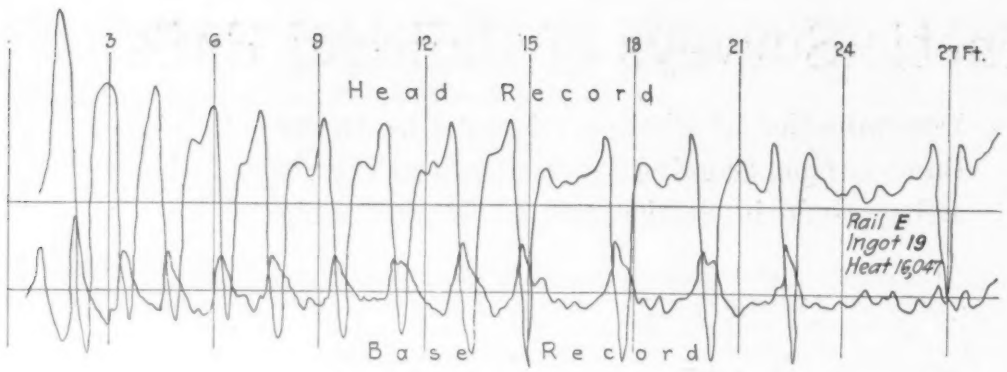
Magnetic Leakage Curves of a New Rail in Which Most of the Gag-Press Blows Were Delivered upon the Base of the Rail

Magnetic Leakage Curves of a New Rail Made from the Sixth Ingot of a Brittle Heat of Steel

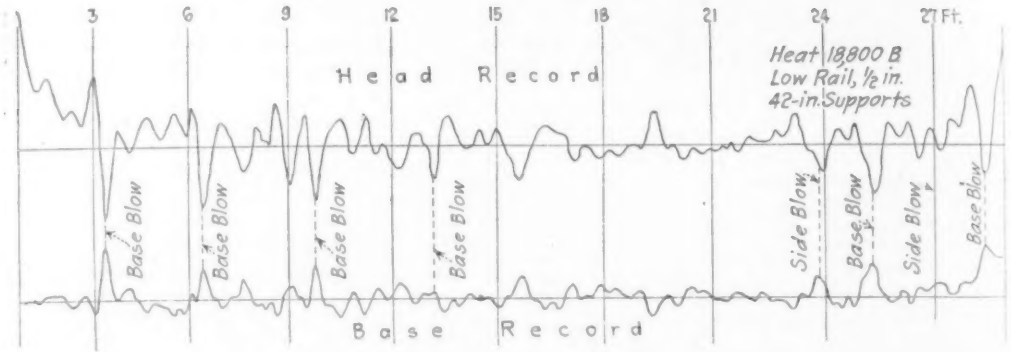


Magnetic Leakage Curves of a New Rail Made from the Twelfth Ingot of the Brittle Heat of Steel

*An abstract was published in THE IRON AGE, July 3, 1919, page 43.



Magnetic Leakage Curves of a New Rail Made from the Nineteenth Ingot of the Brittle Heat of Steel



Magnetic Leakage Curves of a New Rail in Which Most of the Gag-Press Blows Were Delivered upon the Base of the Rail

Three large mills have now replaced all gag presses with new ones, using supports 60 in. apart, and others are following this lead.

Rails on the cooling bed sometimes warp upward and sometimes downward, depending upon conditions. Those warping upward are called high rails, while the others are low rails. The former have to be straightened by gag press blows upon the head; the latter upon the base. These effects are shown in some of the diagrams.

As Dr. Dudley pointed out in his paper, the effect of re-heating rails after once the blanks have been made in the blooming mill is to reduce largely the number of rail failures. From the figures he gave, covering the experience of eight railroads and nearly 900,000 tons of rails (enough for 5600 miles of single track, laid with 100-lb. rails), there was one failure for each 531 tons of rails where the rails were rolled direct, and only one failure for each 5467 tons where the blooms were re-heated before the rails were finally rolled.

Diagrams on these pages show clearly the difference between rails of more or less brittle structure and those which were found from tests to be ductile. The former exhibit very heavy fluctuations in the galvanometer record as compared with the more moderate fluctuations of ductile rails. All rails tested were of open-hearth steel.

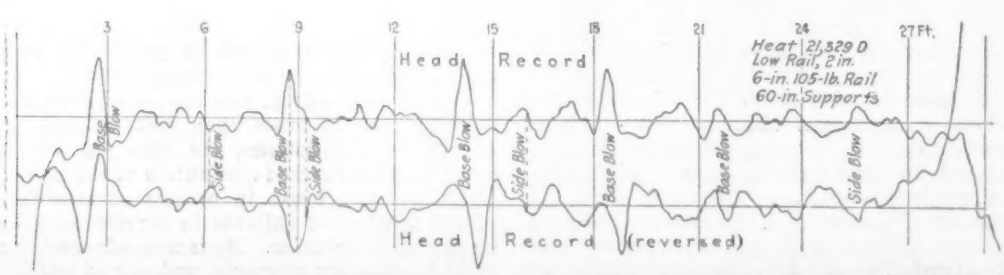
It will be noted, from both sets of diagrams, that the head of the rail seems to show a much more marked disturbance from the gag press than does the base, regardless of whether the blow of the press was applied to the head or to the base. This is due in large measure to the greater mass of metal in the head. The effect of the side blow appears considerably less

Elongation and Exhausted Ductility Tests

Heat No.	Ingot No.	No. of Drop	Permanent Set, In.	Elongation per Inch: 1 In.	2 In.	3 In.	4 In.	5 In.	6 In.	Total
15,475	2	1	1.32	1.04	1.05	1.05	1.05	1.05	1.04	6.28
	20	1	1.32	1.05	1.05	1.05	1.05	1.04	1.03	6.27
		2	2.38	1.08	1.10	1.10	1.09	1.08	1.05	6.50
		3	Broke	1.10	1.13	1.13	1.11	1.10	1.07	6.64
	37	1	1.34	1.03	1.04	1.05	1.05	1.05	1.04	6.26
16,047	2	1	Broke	1.02	1.02	1.05	1.03	1.02	1.02	6.16
	Retest	1	Broke	1.03	1.03	1.05	...	1.04	1.04	...
	10	1	Broke	1.00	1.02	1.02	1.03	1.04	1.03	6.14
	Retest	1	1.20	1.03	1.03	1.05	1.05	1.04	1.04	6.24
		2	Broke	1.03	1.05	1.07	1.12	1.11	1.08	6.46
	20	1	0.93	1.02	1.02	1.04	1.04	1.06	1.06	6.24
		2	Broke	1.02	1.02	1.04	1.05	1.07	1.06	6.26
18,800	2	1	1.10	1.03	1.04	1.05	1.06	1.05	1.04	6.27
		2	Broke	1.04	1.05	1.06	1.08	1.07	1.06	6.36
	20	1	1.32	1.03	1.04	1.05	1.05	1.05	1.04	6.26
		2	2.42	1.05	1.05	1.07	1.10	1.10	1.09	6.46
		3	Broke	1.06	1.07	1.10	1.12	1.12	1.11	6.58
	38	1	Broke	1.04	1.05	1.05	1.06	1.05	1.04	6.29
	Retest	1	1.42	1.03	1.04	1.05	1.07	1.07	1.05	6.31
		2	2.54	1.05	1.06	1.09	1.10	1.10	1.08	6.48
		3	Broke	1.07	1.08	1.13	1.15	1.14	1.11	6.68
21,329	2	1	Broke	1.02	1.03	1.04	1.04	1.03	1.02	6.18
	Retest	1	1.30	1.05	1.05	1.05	1.05	1.05	1.04	6.29
		2	2.22	1.08	1.08	1.08	1.07	1.07	1.06	6.44
		3	Broke	1.09	1.10	1.10	1.10	1.09	1.07	6.55
	20	1	1.24	1.05	1.05	1.06	1.06	1.04	1.03	6.29
		2	Broke	1.07	1.08	1.10	1.08	1.07	1.05	6.45
	33	1	Broke	1.03	1.03	1.04	1.04	1.03	1.02	6.19
	Retest	1	1.32	1.04	1.05	1.05	1.05	1.05	1.05	6.29
		2	2.30	1.07	1.08	1.08	1.11	1.11	1.09	6.54
		3	Broke	1.08	1.10	1.10	1.13	1.12	1.10	6.63

Chemical Analyses of the Steel

Heat No.	Percentage of: Carbon	Manganese	Silicon	Phosphorus	Sulphur
15,475	0.715	0.73	0.149	0.028	0.049
16,047	0.686	0.94	0.160	0.025	0.033
18,800	0.710	0.73	0.161	0.020	0.045
21,329	0.700	0.79	0.125	0.033	0.032



Magnetic Leakage Curves of a New Rail Which Was Straightened on a Gag Press with Supports 60 In. Apart. This rail required a great deal of work on it, for it was 2 in. low in the center; but the distortion to its structure was very moderate, when compared with some of the others shown

than with the head or base blow, principally because it is of less force and consequently distorts the material to a smaller extent.

Chemical and physical tests of the rails involved in the graphic records are appended in two tables. It may be noted that the ingots from which the various rails were rolled were of a size for four rails each in all cases except the heat No. 16047, which happened to be the brittle heat. In this case there were six ingots rolled per rail. The ingot weights for four rails were approximately 5400 lb. compared with 8000 lb. for six rails. The weights of the heats of steel varied from 160,000 to more than 200,000 lb. in the four cases cited. In each case a study was made of the second ingot teemed, the last ingot and an ingot near the middle of the ladle.

In all cases the physical tests were made by dropping a 2000-lb. tup from a height of 20 ft., the section of rail receiving the blow being supported on 36-in. centers. The rails were of 105 lb. Dudley section, with a moment of inertia of 50 in.⁴

Rails which have been surveyed have since been laid in various places on main line track. Some of them have now had about two years of service, but it is still too early to have obtained definite information regarding their probable behavior and life. Ductile rails have been put into high-speed main line track; more brittle rails into freight track or sidings. In other cases, where five or six rails of a heat have developed fissures, all the rails of that heat have been removed from the track for survey.

November Meetings of Steel Treaters Chapters

The New York Chapter of the American Society for Steel Treating was addressed at its November session on Wednesday evening, Nov. 16, at the Engineering Societies Building by T. H. Nelson, works manager Henry Disston & Sons, Philadelphia, on "How Tool Steel is Made: Comparison of Foreign and American Methods of Manufacture." It was illustrated with lantern slides.

At the November meeting of the Hartford, Conn., chapter on Nov. 10, held at Jewell Hall, Y. M. C. A., Hartford, Stanley P. Rockwell discussed "Case Hardening." The December meeting on Dec. 8, will be addressed by George P. Moore, metallurgist Wallace Barnes Co., Bristol, Conn., who will discuss "Spring Manufacture."

The Schenectady, N. Y., chapter, at its monthly meeting on Nov. 15, was addressed by T. S. Fuller, metallurgist General Electric Co., who spoke on "Corrosion of Iron and Steel." The meeting was held in the civil engineering building Union College, Schenectady.

New York Electro Chemists Hold a Meeting in Memory of Dr. J. W. Richards

A meeting of the New York section of the American Electrochemical Society was held Wednesday evening, Nov. 16, at Rumford Hall, 52 East Forty-first Street, New York, at which several addresses were delivered on the life and works of the late Dr. Joseph W. Richards. Dr. Carl Hering, consulting electrical engineer, Philadelphia, reviewed the work of Doctor Richards as president and secretary of the American Electrochemical Society; Dr. W. S. Landis, president American Cyanamid Co., New York, took as his theme, "Dr. Richards as a Teacher at Lehigh University," while H. C. Parmelee, editor *Chemical and Metallurgical Engineering*, reviewed Doctor Richards' work as an editor and author. These memorial addresses were followed by one by Dr. Frederick G. Cottrell on "Personal Observations on the Russian Situation."

The eleventh annual convention of the Sheet Metal Products Association will be held at the Congress Hotel, Chicago, Dec. 8 and 9. The secretary is D. C. Jones, P. O. Box 769, Chicago.

The National Metal Trades Association announces that its next annual meeting will be at the Hotel Astor, New York, on April 19 and 20, 1922.

HIGH LABOR COSTS

Investigation at St. Louis Shows Why Building Has Been Retarded

ST. LOUIS, Nov. 15.—A conference of master builders, the building trades unions of St. Louis, material men and bankers begun last week in an effort to adjust conditions so that work may be started on building projects totaling more than $20,000,000, was adjourned until to-day. The work of the conference has been given an impetus by a proclamation issued by the mayor who recites that lack of building is retarding the city's economic progress and contributing largely to unemployment and states that concerted action by investors, contractors, material men and the unions is necessary to remedy the situation.

The conference followed the publication of the results of an exhaustive investigation into building conditions in St. Louis made by the St. Louis *Post-Dispatch*, in which it was ascertained that building projects of an estimated cost of $20,165,000, for which plans have been drawn, are held in abeyance because of the high cost of labor.

The present wage scale in St. Louis, to which the builders object, ranges from 67½c. an hour for laborers to $1.37½ for plasterers and hoisting engineers. The rate of $1.25 an hour applies to carpenters, cement finishers, electricians, lathers, painters, bricklayers, elevator constructors, ornamental iron workers, sheet metal workers, steam fitters and structural iron workers.

The president of the Building Trades Council has said that the men would be willing to accept a reasonable reduction provided this would assure that building would go forward. It is believed that the rate will be reduced from $1.25 to $1 an hour.

Construction 25 Per Cent Ahead of Last Year

Building contracts awarded during October in the 27 northeastern States of the country, according to the statement of the F. W. Dodge Co., amounted to $222,480,000. This figure is 25 per cent greater than the figure for October, 1920, and only 10 per cent less than the figure for September, 1921, which was a record month.

There was a marked increase in activity in New England during October. Other sections showed moderate declines, well within the range of seasonal declines that were to be expected.

Residential building still leads among the classes of construction, having amounted to $89,650,000 in October. This was 40 per cent of the total construction for the month.

Second in importance was the business building group, amounting to $37,405,000 in October, or 17 per cent of the total, a very good showing for this class of work.

Public works and utilities amounted to $35,141,000 in October, about the same as the September figure. Industrial building in October amounted to $18,419,000, an increase of 63 per cent over the September figure.

Contemplated new work reported in October was 24 per cent greater than in September.

Considering the large volume of construction started within the past two months, it appears that activity will continue at a very substantial rate through the winter months.

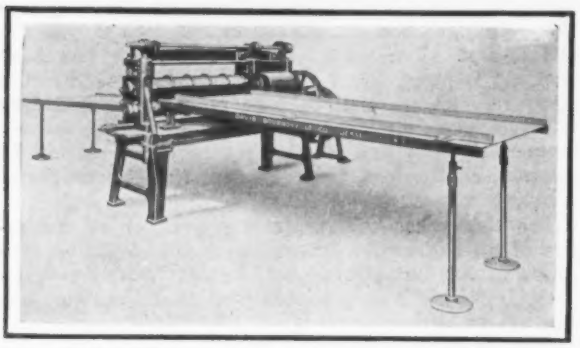
More Building in Detroit

DETROIT, Nov. 12.—New work coming from the offices of the architects shows an ever increasing volume, according to the latest weekly report of the Builders' and Traders' Exchange. The trend of conditions in the building industry is noted in the different types of new work coming out, virtually every type of construction being represented in the week's work. Although the residential class is still leading in volume, a new note was struck in industrial construction, more work of this type being reported than for some time previously.

WELDED TUBE MANUFACTURE

Machinery Required for Tubes ⅝ to 4 in. Diameter from Sheets of No. 10 and No. 22 Gage

The equipment of machinery necessary for the welding and fabricating of tubing, such as used in the construction of automobiles, bicycles, motorcycles, furniture, beds and office appliances, has been studied by the Davis-Bournonville Co., Jersey City, N. J., thus to supply machinery to plants taking up such manufacturing. The equipment comprises gang slitters, tube forming machines, welding machines, straighteners, seam grinders, cutting-off machines, draw benches, swagers and bending machines.

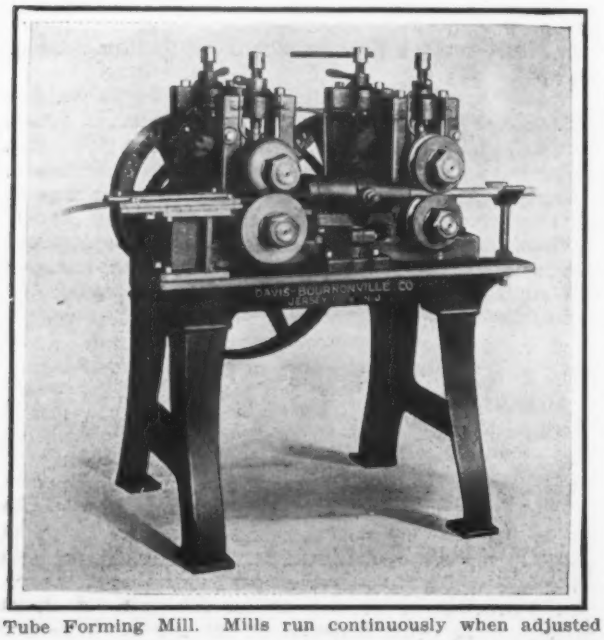


Gang Slitter. One end bearing housing may be swung out of position, facilitating removal of cutters

The commercial thought behind the lining up of the various machines for the given range of work is that manufacturers of specialties have then at their command the means for producing tubes of any common diameter and gage on short notice. Commercial steel sheets of any thickness from No. 10 to No. 22 may be cut into strips to form tubes from ⅝ in. to 4 in. in diameter and welded to meet immediate needs. With this equipment, it is not necessary, it is said, to carry in stock tubes of many diameters and gages to meet anticipated uses, but instead commercial sheets may be bought in the open market as required, or sheet stock in few gages kept on hand ready for slitting, forming, welding and subsequent operations. In the case of makers of welded tubing for the market, however, it is generally an advantage to purchase tube stock in strips trimmed to the required width.

The exact equipment required depends on the material to be used and the fabrication needed before leaving the tube shop. Where mill sheets are to be cut into strips suitable for the next operation, tube forming, slitting machines are required. Gang slitters of the type shown in the illustration are furnished in various styles and sizes for cutting sheets from 18 to 52 in. wide and up to 10 gage thick. The shafts are of alloy steel ground to dimensions and are fitted with keys the entire working length. Bearings run in bronze bushings and provision is made for simultaneous adjustment of bearings, thus maintaining accurate alignment. The cutters are made from steel forgings accurately ground, and re-sharpened by face grinding, thereby maintaining the original settings. The cutters are arranged to be used in opposed pairs and are set up with one wide and one narrow ring spacer.

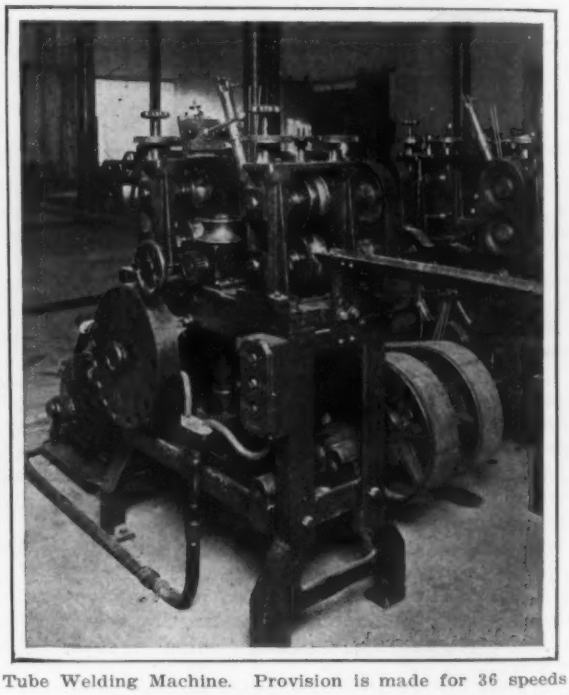
One end bearing housing may be drawn off the shafts by a screw and swung out of position thus permitting the cutters and spacers to be removed and changed in a few minutes' time, a feature particularly emphasized by the makers. Tables are provided on each side of the full width of the sheet to be cut. The feed table is fitted with adjustable guides. The normal cutting speed is 50 ft. per min., and the drive is through a friction clutch.



Tube Forming Mill. Mills run continuously when adjusted

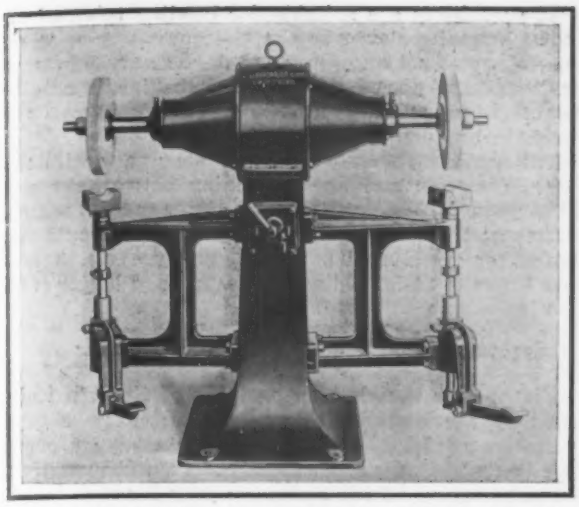
Tube Forming and Welding

Tube stock, whether cut from mill sheets or in rolled strips, must be form-rolled preparatory to welding. The tube forming mill illustrated is of the two-roll stands type, but a three-roll type is also made. The two-roll type comprises breakdown and finishing roll stands and operation is by one man who handles both the strips and the formed tubes. A hollow conical conductor between the roll stands completes the forming started by the first pair of rolls, and the second pair compresses the formed tube into a truly circular shape. Adjustments of the tube forming rolls may be made while the machine is running. Tube forming speeds are from 50 to 100 ft. per min., depending on diameter and gage. The three-roll stand type is similar to the two-roll type but has an extra stand of rolls.



Tube Welding Machine. Provision is made for 36 speeds

From the tube forming machines the tubing goes to the welding machines and thence to the inspector's station where unwelded spots are welded with hand torches. The illustration shows the No. 1 tube welding machine which is furnished for right or left hand operation, with or without motor drive and push button control. The usual power equipment comprises 230-volt adjustable speed direct current motor, field rheostat, magnetic control panel and push button station, with reverse. The speed range is said to be ample for all gages and diameters, provision being made for 36 speeds. The motor drives through a belt, and the equipment having dynamic braking characteristics permits instant control. Starting, stopping and reversing are



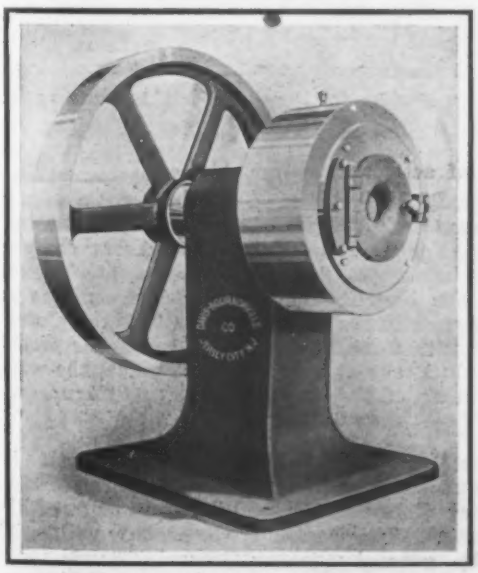
Machine for Grinding Off the Bead Produced by the Weld

said to be effected without shock. The main drive mechanism is covered and runs in oil.

The rolls are individually adjustable for alignment and the guide rolls are adjustable in relation to the welding rolls. The welding rolls are vertically adjustable to eliminate contraction stresses in the cooling metal, a feature intended to produce stronger welds. Rolls are furnished for any diameter tube from ½ inch to 3 inches, inclusive. Welding speeds vary between 36 and 72 in. per min. Conductors are furnished for 1¼ in. and smaller diameters of tubes to be placed between the welding and finishing rolls. A universal torch adjusting arm is furnished when required.

In the No. 2 tube welding machine all rolls are overhung. This is a feature emphasized by the makers, as it permits of quick and easy changes. The machine is furnished for right hand operations only. A two-speed gear change in the base, with the adjustable speed motor provides variations of welding speeds from 24 to 168 in. per min. Bearings subjected to heat are water cooled, water being circulated through cored spaces within the housing. Provision is made for two sets of following rolls to facilitate welding at the higher speeds. Rolls are furnished for tube diameters of 1¼ to 4 in. inclusive, 18 to 10 gage wall thickness.

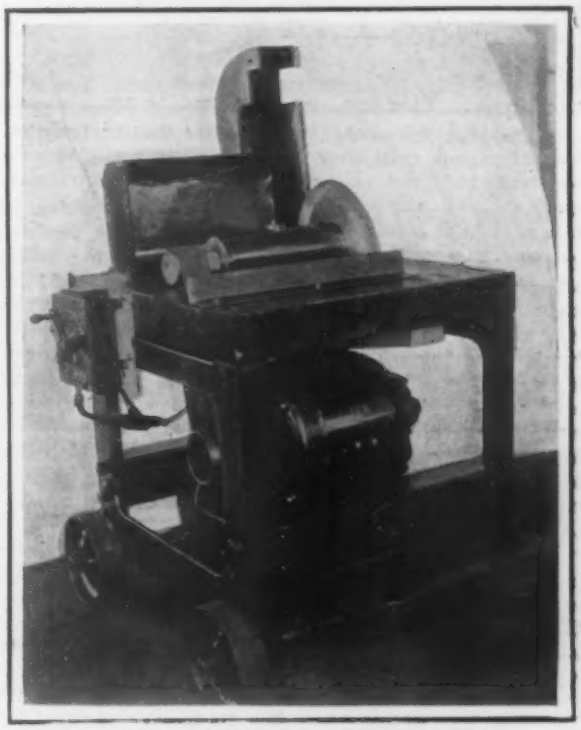
The welding tips for the tube welding machines are of the multiple-flame type, the number and arrangement of flames varying with the gage and diameter of the tube, speed of welding and kind of metal. These tips are emphasized by the maker as an important feature of the equipment. The larger tips are water-cooled in order to maintain uniform heat conditions, the cooling water being circulated through the tip and from thence into the barrel of the torch.



Tube Swaging Machine; May Be Equipped with Mechanical Feeding Device

Tube straightening machines are furnished in three sizes, all being of the ten-roll type with rolls arranged in two sets of five each, at right angles. Three rolls of each set are power driven, the last roll in each set being adjustable. The No. 1 machine has a capacity for tubes up to 1 in. diameter; the No. 2 machine straightens up to 2 in. diameter, and the No. 3 handles tubing from 1½ to 3 in. diameter.

Having been run through a straightening mill, the tubes then go to the seam grinders to remove the slight ridge produced by welding, or to the draw bench. In case of finishing by drawing, it is not necessary to grind off the ridges. The tube grinding machine is shown in the illustration. The tube passes under the wheel at an angle while supported in a formed rest elevated by foot pressure. Two operators may work simultaneously. The machine comprises a 7½-hp. alternating current ball-bearing motor, the armature shaft of which is extended to carry a grinding wheel at each end. The foot control pressure mechanism and tube guides are arranged to grind tubes at any desired angle. The wheel faces wear concave to fit the tubes,



Tube Cutting Machine with Saw Guard Raised

thus preventing the grinding of flat spots and permitting the full width of the wheels to be used.

Tapered tubes are generally made by swaging and a great variety of shapes and combinations can be produced by this process. A swaging machine for the purpose is shown in the illustration. It is of the rotary type using ten or more rolls in the head. The cage, rollers and dies, it is said, are of such design as to effect almost noiseless operation. The backs of the dies have a cam shape over which the rollers ride without destructive shock to themselves, the resultant action of the dies on the metal worked being more of a squeeze than a blow.

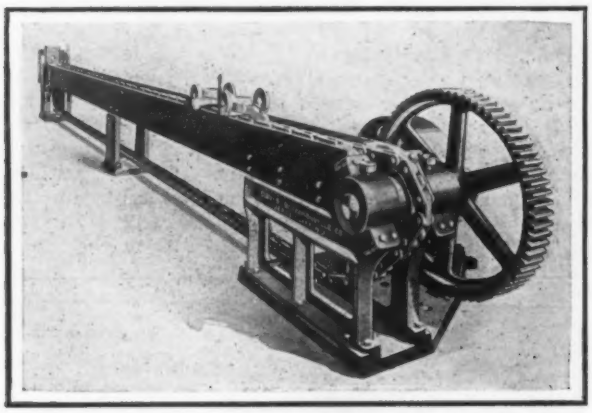
Three sizes are furnished, each of which may be fitted with dies of any practicable length. Mechanical feeding devices can be furnished.

The tube cutting machine shown in the illustration is part of the equipment, being designed for the rapid cropping of tubes. It is motor driven, the motor being mounted on the base of an oscillating cutting head carrying the saw arbor. The mechanism oscillates on a shaft mounted in bearings cast integral with the frame. The cutting head is held back against a stop by a coil spring and is actuated by a foot treadle through a linkage which permits the operator to exert the required pressure of the saw on the tube without undue fatigue. The usual diameter of the saw is 14 in. and

thickness 3/32 to ⅛ in. The saw arbor is mounted on ball-bearings packed in grease. The motor is 5 hp. and of any suitable type to drive the saw at speeds from 3000 to 4000 r.p.m. by an endless leather belt.

Draw Benches and Bending Machines

Draw benches constitute an important part of the fabricating equipment necessary to the tube maker. The draw bench illustrated, known as the No. 1, has capacity for tubes up to 2 in. diameter, 14 gage. A No. 2 machine is also furnished which has a capacity for drawing tubes up to 3 in. diameter, 14 gage. The construction embodies a single heavy steel H-section bolted between heavy head and transmission castings. The main chain is of the usual 2 and 1 construction, running over a steel sprocket driven by heavy double reduction gearing. The chain is adjusted by a grooved idler wheel, the bearings of which slide in slots in the head casting. The dog is made of heavy steel castings mounted on rollers running on the beam flanges. The dog jaws are machined for removable grips which may be serrated or machined to grip round tubing without marring. All shafts run in bronze bushings or split babbitt-lined bearings.



Drawbenches Are of Two Sizes and of Various Lengths, Equipped with Back Benches When Specified

Draw benches are fitted with back benches for drawing tubes over a plug or mandrel when required. Back benches are made from smaller H-section steel beams than used for the main section, and are provided with end casting and support for rod attachment. The driving clutch is operated by a shaft running the length of the bed and having a lever at the head of the bench. Solid dies and adjustable roller die heads are furnished extra.

Tube bending machines constitute the final item of equipment and are furnished in three sizes, designated No. 1, 2 and 3. The No. 1 machine, shown, is for round tubing and is furnished without power plug attachment. All machines are equipped with double clutch pulleys for operation in either direction. Nos. 2 and 3 machines are equipped with power attachments and back bench when required. Power attachments are made in various forms suited to the class of work to be done. The power attachment operates a rack to which is attached a plug for internal support when bending. The rack controlling the plug may be operated by power in either direction.

The main drive of the machines is through reduction gearing and steel worm operating a bronze worm wheel or a cast-iron worm wheel with band for the teeth, this construction depending on the work for which the machine is required. The oscillating tube carriage carrying the roll, vise and other parts are mounted on the worm wheel shaft. The carriage is so made that the tools for various diameters and radii can be readily attached. A stationary half die, furnished in conjunction with the oscillating members, is actuated by a cam or screw or in conjunction with a follower.

Directly beneath the worm wheel there is a dog operating on adjustable knock-outs which limit the angle to which a bend is made.

The machines are suitable for bending tubes of all kinds of metal and of any shape—square, rectangular, etc.—to angles not exceeding 180 degrees. The operating levers are placed so that the machine is readily controlled by one operator; two men are employed for maximum production.

The number of bends made per hour vary with the length, diameter and angle, running between 60 and 120 per hour. The No. 1 machine bends to 8-in. radius, maximum; the No. 2 bends to 12-in. radius maximum, regular, or 25-in. radius special, and the No. 3 machine bends to 35-in. radius, maximum, and larger radii to order.

Electricity in Britain and America

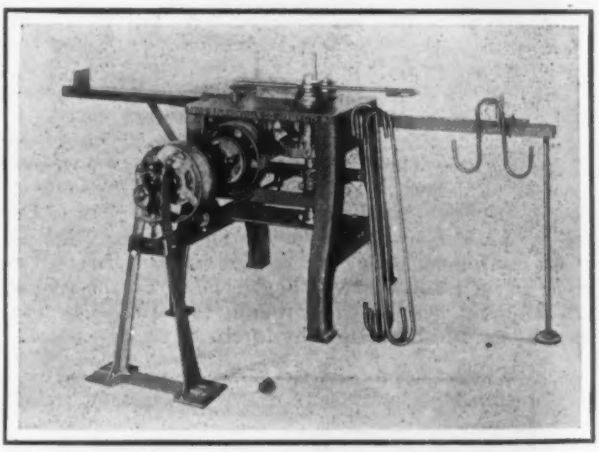
Figures for the electricity supply of Great Britain, issued by the Electricty Commissioners, show a total generation of 5,167,337,094 kwhr. for the year ended March 31. This, for a population of 42,767,530 in 1921, gives an average of 121 kwhr. per year for each inhabitant.

United States geological survey figures for the first nine months of 1921 show an average of 3,324,353,000 kwhr. per month. Based on a population estimated at 107,500,000 in 1921, this amounts to an average of 371 kwhr. per year for each inhabitant, or more than three times the British average.

Lack of standardization is given as the chief reason for the slow growth of British use of electricity. It is pointed out that in Greater London alone there are some 70 generating stations, representing a total of 50 different systems of supply, 24 different voltages and 10 different frequencies. This situation has made for unnecessary expenditures, wasteful use of coal and higher charges than proper co-ordination would have provided.

More Active Coke Ovens

PITTSBURGH, Nov. 14.—The H. C. Frick Coke Co. put in operation 600 more coke ovens to-day, bringing the number of active units of the company to 1702. The company has started up 200 ovens at Colonial No. 1, 150 ovens each at Leisenring No. 2 and at Lemont, and 100 at Youngstown, Ohio. The parent company recently has blown in blast furnaces at Youngstown, Ohio, and New Castle, Pa., and this explains in part the increase in the production of coke. Supplying those stacks with Connellsville coke permits the stocking of by-product coke at Clairton, Pa., against the winter requirements of the Pittsburgh district furnaces.



Bending Machine for Round Tubing. Maximum radius of bend is 8 in.

The December meeting of the New England Foundrymen's Association will be in the form of a complimentary dinner to the 30 past presidents of that organization. The speaker of the evening will be Richard H. Rice, general manager General Electric Co., Lynn, Mass. The dinner will be held at the Exchange Club, Boston, on the evening of Dec. 14.

General Freight Reductions May Come Soon

Conference of Railroad Officials in New York in Regard to Ore Rate May Be Followed by Action as to All Raw Materials

WASHINGTON, Nov. 15.—Instead of giving a prompt reply to the urgent requests of lake front iron and steel interests for lower rates on coal and coke, the railroads have called a conference for Thursday of the present week at 143 Liberty Street, New York, for the ostensible purpose of considering a plan to restore as of next Jan. 1 the rates on iron ore from lower lake ports to interior furnaces, which were reduced on Oct. 18. Attending the conference will be representatives of the iron and steel industry from the various sections of the country. Indications are that it will be a lively session of great importance, affecting the entire trade and upon which may hinge hastening or further delay in returning to an adjustment to a normal basis, depending upon whether further rate cuts may be the outcome or the old ore rates be restored. To some in the trade, it hardly seems conceivable that the carriers actually will attempt to restore the old rates on iron ore unless it is done as a temporary matter with a view to bringing down the entire rate structure as it relates to the iron and steel trade in a simultaneous move shortly afterward. Because of this it is believed that the conference will in a formal sense only deal with the question of restoring the old rates on iron ore. The belief prevails that it will take on a much wider scope and that, whatever may be done, it means that in the not distant future there will be a general reduction in rates on raw materials used and manufactured by the iron and steel industry.

Restoration of Ore Rate

The situation has been described as being entirely too indefinite on which a date for such action may be predicated, but confidence is felt that a general reduction must be forthcoming within a comparatively short time. A restoration of the old rate on iron ore from the lower lake ports to interior furnaces, it is pointed out, plainly would check progress toward readjustment of the industry with its heavy costs of operation in which high freight rates are such an important item. But if they are restored on Jan. 1 as a move toward re-establishment of so-called relationships between ore and fuel rates with the purpose of bringing down all of the rates at the same time at a period soon after, it has been stated, the railroads may feel that they have arrived at a solution of a problem which at present is a source of differences of opinion within the industry itself. Some men in the trade frankly are of the impression that these differences have done any injury to the trade and will tend to delay freight rate reductions of a general character. They are insisting that the cuts be made at once and are strongly hoping that there be no return to the old rates on ore. Others, however, as shown at the informal hearing here on Monday of last week claim that either the old rates on iron ore should be restored or rates on coal and coke to lake front producing interests be made immediately in order to maintain the relationship between fuel and ore rates. The lake front manufacturers say that otherwise they are the object of discrimination in favor of interior producers who have been granted lower ore rates. At the same time, there are those who believe that, so far as rate making goes, no reason exists for maintaining a relationship on assembling material for the production of pig iron.

Restoration of old iron ore rates from lower lake ports on Jan. 1 would in itself not be of much importance. The shipping season from mines will of course long have been closed by that time and the great bulk of dock ore moved to interior furnaces. Lake front makers have pointed out that the latter situation would be especially true this year because shipments would be stimulated more than ordinarily under the lower rates and previous to the restoration of the old rates. This fact has been cited by lake front interests to show that regardless of what the carriers may do about returning to the old rates, discrimination of a marked character has been practiced.

The tariffs effective Oct. 18, lowering the ore rates, carry plainly the provision for a restoration to the old rates on Jan. 1, but the trade has felt that this was largely a formal matter adopted by the carriers as a check to which they could turn should that be considered expedient. Whether or not they had in view the situation that has actually developed is only a conjecture.

Attitude of the Commission

It is a question of considerable discussion as to what the Interstate Commerce Commission can do regarding the ore tariffs in case the railroads attempt to restore the old rates on Jan 1. The assumption is that the commission could not prevent such action. The rates were lowered voluntarily by the carriers and not through an order of the commission, which approved the tariffs, at least to the extent of allowing them to go to its files with the language which, if nothing is done, will automatically restore the rates.

The subject takes on exceptional importance because of the drive for lower rates, a matter of a conference last Saturday between the railroad executives and the commission relating particularly to agricultural products, but which shippers of the country generally hope will prove to be an entering wedge toward a general reduction in rates of all kinds. They appreciate the problems of the railroads, their financial conditions, the necessity to guard their revenues, etc., and need for cutting wages, but also maintain that rate reductions could be made before some of the problems of the railroads are worked out and that it would be as helpful to the railroads themselves as it would to industry. Should the carriers in the ore rate situation practice the policy of limiting reductions to a specified time, and the commission in that way be divested of power to suspend rates, the carriers would acquire control over rates such as they have not had for many years. The allowing by the commission of the ore tariffs to become effective, it is pointed out, does not constitute a bargain between the carriers and the commission because there is no authority under which the commission could close the door in such a manner to formal protests.

Ferromanganese Anti-dumping Case Dismissed

WASHINGTON, Nov. 15.—Without an accompanying written decision, the Federal Trade Commission last Saturday issued an order dismissing its complaint in the ferromanganese anti-dumping case "for failure of proof." The opinion was unanimous, and sustains the recommendation made in the tentative report submitted by Trial Examiner Edward M. Averill, who had charge of the hearings.

While it is not unusual for the commission not to present written opinions with its orders, disappointment has been felt that it omitted such a finding in this case, which is the only one of the kind that ever

came before the commission and one of the principal issues was the question of jurisdiction. Attorney Joseph E. Davies, of the law firm of Davies & Jones, representing one of the respondent companies, Crocker Bros., maintained among other things during the hearings and arguments that the commission did not have jurisdiction under Section 5 of the act of Congress, approved Sept. 26, 1914, entitled, "An act to create a Federal Trade Commission, to define its powers and duties and for other purposes," under which the complaint was brought. Filed on March 3, 1920, the complaint, the outgrowth of claims by makers of domestic ferromanganese that importers of English ferromanganese dumped that alloy in the markets of the United States from June to December, 1919, at "substantially less" than the home market value and that the alleged practice constituted an "unfair method of competition." It was specifically under the latter charge that the complaint was made. It was the contention of Mr. Davies that the remedy, if any were required, under the act, rested with the courts which have responsibility for enforcement of the act. On the other hand, Attorney I. E. Lambert, who represented the commission, asserted that enforcement of the act rests with the commission. Because of the fact that an order of dismissal has been issued, it is assumed that the commission interprets the act to mean that it has jurisdiction, but it has been pointed out that this is not necessarily true. In any event the commission's discussion of the question of jurisdiction, it is held, would have been helpful as a guide for further proceedings of this character and afford the business interests of the country a clearer understanding of the question than they now have.

There also was a desire to learn the attitude of the commission as to the admissibility of trade paper quotations as determining evidence. This matter was the subject of considerable argument. Attorneys for the respondents contended that trade paper quotations were permissible as evidence, but not sufficient as a conclusive factor, while a contrary view as to the latter point was taken by Attorney Lambert. Examiner Averill in his tentative report made reference to the subject, when he said that "The published English home market quotations show that the usual customary rise or fall of ferromanganese is £2, and to be 'substantially less than the actual market value' there would have to be a drop certainly much greater than the customary market fluctuation." It was the opinion of the examiner that "There is no evidence that the importing and selling of ferromanganese by the respondents or their principals into the United States was done with any intent to injure the industry of manufacturing ferromanganese in the United States, and there are no facts or circumstances proved from which such intent can logically or legally be inferred."

The examiner also omitted discussion as to the question of jurisdiction, but apparently assumed the commission had jurisdiction. Interest is being shown as to whether the domestic makers of ferromanganese will now turn to the plea of the respondents regarding lack of jurisdiction and attempt to take the case to the courts, or seek to bring it before the customs officials of the Treasury Department under authority of the anti-dumping act.

The respondents in the case included Crocker Bros. and C. W. Leavitt & Co., New York, and Frank Samuel, Philadelphia. Originally the complaint included the name of Rogers, Brown & Co., but the case against them was dismissed during the hearings owing to the fact that they did not sell for the account of the principals in 1919 in the United States.

Increased Buying Power of the Pay Envelope Dollar

The larger purchasing power of every dollar in the pay envelope of 1921 as compared with 1920 has been brought before employees in various ways. None is more striking than the list of food products and household supplies which appears on a leaflet prepared by Frank J. Herman, 71 Broadway, manager of the New York office of Pilling & Co., Philadelphia. Mr. Herman is vice-president of the Austen Coal & Coke Co. No reduction in wages was made at the company's mine, but the purpose of the leaflet was to impress upon the men the fact that their wages have been steadily increasing. The comparison is given below, the prices being those prevailing at the Austen Coal & Coke Co. store:

The Purchasing Power of $30.00 During the Year 1920	
100 lb. granulated sugar	$25.00
20 lb. rice	3.00
1 bag flour, 24 lb.	2.00
	$30.00

The Purchasing Power of $30.00 During the Year 1921	
100 lb. granulated sugar	$7.50
20 lb. rice	1.60
1 bag flour, 24 lb.	1.50
10 lb. navy beans	.80
1 box toothpicks	.05
½ doz. cans best peaches, No. 3	2.10
½ doz. cans best sweet corn, No. 2	1.08
½ doz. cans large tomatoes, No. 3	1.08
1 lb. Rumford's baking powders	.35
1 pint Monarch catsup	.30
1 quart apple vinegar	.20
10 lb. loose coffee	1.50
1 bottle vanilla	.15
2 packages oats	.25
½ doz. cans pork and beans, No. 2	.90
100 cakes laundry soap	7.00
3 jars apple butter, 26 oz.	1.05
½ doz. cans milk	1.80
4 cans peas, No. 2	.72
1 box matches	.07
	$30.00

Below the tabulation is the legend, "Do you need more facts to convince you that the cost of living has been reduced in Austen?"

Will Erect Blast Furnace

SEATTLE, WASH., Nov. 12.—Investigations which tend to show that iron ore exists in commercial quantities in this State are the background for the building of a blast furnace and steel plant at Tekoa, Wash., in the eastern part of the State, according to W. C. Hayward, president of the Commerce Steel Corporation, who declares that iron ores in the vicinity of Tekoa are equal to the Lake Superior ores. Mr. Hayward explains that only hematite ores so far have been found in this territory. He announces that his corporation will start construction immediately on a 75-ton capacity furnace.

Announcement here by transcontinental traffic officials of a proposed reduction of export steel rates contingent upon the assent of Eastern originating and intermediary carriers is expected, if ratified, to increase steel exports from the Pittsburgh and Colorado districts to the Orient through the Port of Puget Sound. It is stated that the pre-war export rate of 60c. on iron and steel from Chicago and Birmingham will be restored. The rate from Pittsburgh is to be 69c. and from Minnequa, Col., 46c. A rate of $1.20 on minimum shipments of 80,000 lb. per car will be put into effect on tin plate from New York and intermediate points, this item being of particular interest to fish and fruit canners here.

Steel Corporation's Unfilled Orders Decline

Unfilled orders on the books of the United States Steel Corporation Oct. 31 were 4,286,829 tons, compared with 4,560,670 tons on Sept. 30, a decrease of 273,841 tons. This decrease compares with an increase of 28,744 tons in September, and decreases of 298,398 tons in August, 287,544 tons in July, 364,619 tons in June, 362,737 tons in May, 439,541 tons in April, 649,102 tons in March, 639,297 tons in February, and 574,958 tons in January. The unfilled tonnage a year ago was 9,836,852 tons, or 5,550,023 tons more. The table below gives the unfilled tonnage at the close of each month, beginning with January, 1918:

	1921	1920	1919	1918
Jan. 31	7,573,164	9,285,441	6,684,268	9,477,853
Feb. 28	6,933,867	9,502,081	6,010,787	9,288,443
Mar. 31	6,284,765	9,892,075	5,430,572	9,056,404
Apr. 30	5,845,224	10,359,747	4,800,865	8,741,882
May 31	5,482,487	10,940,465	4,282,310	8,337,623
June 30	5,117,868	10,978,817	4,892,855	8,918,866
July 31	4,830,324	11,118,468	5,578,661	8,883,801
Aug. 31	4,531,926	10,805,038	6,109,103	8,759,042
Sept. 30	4,560,670	10,374,804	6,284,638	8,297,905
Oct. 31	4,286,829	9,836,852	6,472,668	8,353,293
Nov. 30	.....	9,021,481	7,128,330	8,124,663
Dec. 31	.....	8,148,122	8,265,366	7,379,172

The largest total of unfilled orders was on April 30, 1917, when it was 12,183,083 tons. The lowest was on Dec. 31, 1910, at 2,605,747 tons.

How Disarmament Affects Steel Makers

Probable Amount of Scrap Involved—Effect on Armor-Making Capacity—Total Annual Steel Tonnage Devoted to Warship Building Almost Negligible

BY L. W. MOFFETT

WASHINGTON, Nov. 15.—Momentous as it is from a point of limitation of naval armament, the proposal of the American Government laid before the arms conference to scrap 15 capital ships now under construction for the American Navy would involve only 422,703 tons of steel, or approximately 1.25 per cent of the entire finished rolled output of the country in 1920, which totaled 32,347,860 gross tons. This, of course, is exclusive of the foundry production of steel castings.

The steel required for these 15 capital ships, consisting of nine battleships and six battle cruisers, with a total displacement of 618,000 tons, is divided in the various classes as follows:

	Net Tons
Plates	209,850
Shapes and bars	54,210
Pipes and tubes	17,469
Rivets	15,150
Castings	9,000
Forgings (guns)	6,714
Armor plate	110,310
Total	422,703

Old battleships which it is proposed to scrap number 15, with a displacement of 227,740 tons. Estimating the steel requirements on the basis of that included in 618,000 tons of displacement in the nine battleships and six battle cruisers, it would involve about 160,000 tons, making a grand total of 582,703 tons of steel in the 30 ships this Government would scrap.

No other types of war vessels having as yet been mentioned for scrapping, no calculation is made with regard to them. And the tonnage displacement of capital ships may fairly be taken to measure the relative strength of navies, as the provision for auxiliary combatant craft should sustain a reasonable relation to the capital ship tonnage allowed.

It also is not possible to give accurate figures as to the tonnages of steel represented in the ships of Great Britain and Japan which Secretary Hughes has proposed shall be scrapped. But basing them on the same terms as the American vessels, it is estimated that the 583,375 tons of British displacement it has been suggested should be scrapped, as well as that already scrapped, involves approximately 350,000 tons. This includes four Hoods, and those pre-dreadnaughts, second line battleships, and first line battleships up to but not including the King George V class, making 19 capital ships. The Japanese displacement it is proposed to scrap aggregates 448,928 tons, or about 200,000 tons of steel, on the basis of preceding calculations. The Japanese vessels include two battleships, four battle cruisers not laid down as yet, three battleships and four battle cruisers either laid down or having the material for them assembled, and ten older ships.

Steel Which Would Be Scrapped

The steel, therefore, included in the entire scrapping program, together with construction which it is proposed to abandon and not yet laid down, approximates 1,132,000 tons, divided as follows:

	Net Tons
America	582,703
Great Britain	350,000
Japan	200,000

This tonnage represents only about 3.5 per cent of the finished steel output of the United States of last year, and reflects further what a relatively small item peace time military activities are to steel production. As a matter of fact, the laying down of three capital ships per year, of the 35,000-ton size permitted by the program, would require the provision of some 85,000 tons of steel per year, which is but one-fourth of 1 per cent of our 1920 production.

From a point of armor plate, high tensile and forging steel, obviously a different situation presents itself. Naturally, armor plants are devoted exclusively to producing material for war vessels, and if the program of Secretary Hughes, or one that is anything like it, should be adopted, there would be an excess of armor making capacity in the United States. The American proposal would put Great Britain and America on a parity after the expiration of the suggested 10-year holiday, by allowing each country a maximum of 500,000 tons of capital ships. Japan would be allowed 300,000 tons. Assuming that each battleship may require 10,000 tons, and a battle cruiser 6000 tons, and placing the ratio two battleships to one battle cruiser, the 500,000 tons of displacement would call for a total of about 130,000 tons of armor for (each) the British and American navies, and about 80,000 tons for the Japanese Navy. But the annual armor replacement would be only about 5 per cent of this, or 6500, 6500 and 4000 tons, respectively. The present armor making capacity of the United States is approximately 41,000 tons annually, figuring each of the private plants at 11,000 tons and the naval plant at Charleston, W. Va., at 8000 tons. So, figuring replacement in 20 years for each capital ship, the present armor making capacity of the United States alone would be far greater than the annual requirements of all three nations. This might indicate probable scrapping of armor making capacity to a considerable degree, although such a plant necessarily is not operated continuously, and is held partially as a reserve.

Cost of Scrapping

The first cost of scrapping the American ships would be heavy, as is indicated by the statement of Secretary Hughes that, on the 15 capital ships it is proposed to scrap, already more than $330,000,000 has been spent. It would be necessary also, in cancelling contracts with steel makers and shipbuilders, to compensate them for their investments in the way of materials, organizations, etc. These contracts are subject to cancellation which, according to form, is to provide settlement "satisfactory to both parties," the Navy Department and the private manufacturer and shipbuilder.

Generally these settlements are easily made, the contractor accepting the terms of the Government often rather than go to the court of claims for what may be considered adequate compensation. Once these payments were made, however, the load on the taxpayer obviously would be greatly lightened. It is estimated

that the operating cost of the navy is between $500,000,000 and $600,000,000 annually.

Possible Salvage

There would, however, be some return, though comparatively light, in all probability, when the ships are scrapped. It is proposed that they be dismantled, and not sunk, and the material salvaged. Some of them will undoubtedly be made to serve as targets. Past experience shows that the salvage would be only an extremely small part of the original cost of the ships. The steel probably would have to be cut to size and used altogether as scrap, where it could be used at all. The greater value might lie in the extremely intricate and costly machinery, tools, etc. But once machinery is installed in a vessel, as is ordinarily the case when it is half-completed, it is difficult to salvage it in good condition.

On Nov. 1, the nine American battleships it is proposed to scrap were from 10.4 per cent to 83 per cent completed; while the six battle cruisers, which would undergo the same fate, were from 11.1 per cent to 29.4 per cent completed. Four of the battleships and two of the battle cruisers are being built at navy yards. The time of delivery of all 15 vessels is marked as indefinite. The official statement of the Bureau of Construction and Repair, Navy Department, regarding the degree of completion of the vessels, together with other facts, follows:

		Per Cent of Completion Nov. 1, 1921	
Battleships	Contractor	Total†	On Ship
Colorado	New York Shipbuilding Corporation	83.0	81.6
Washington	New York Shipbuilding Corporation	69.8	63.6
West Virginia	Newport News Shipbuilding & Drydock Co.	64.0	57.3
South Dakota	New York Navy Yard	35.2	27.7
Indiana	New York Navy Yard	33.2	25.1
Montana	Mare Island Navy Yard	27.6	19.0
North Carolina	Norfolk Navy Yard	36.7	27.1
Iowa*	Newport News Shipbuilding & Drydock Co.	29.9	25.5
Massachusetts*	Bethlehem Shipbuilding Corporation (Fore River)	10.4	3.9
Battle Cruisers			
Lexington	Bethlehem Shipbuilding Corporation (Fore River)	26.7	17.8
Constellation	Newport News Shipbuilding & Drydock Co.	15.5	13.7
Saratoga	New York Shipbuilding Corporation	29.4	22.2
Ranger	Newport News Shipbuilding & Drydock Co.	2.9	1.2
Constitution	Philadelphia Navy Yard	11.7	6.8
United States	Philadelphia Navy Yard	11.1	6.2

*Contract calls for completion July 12, 1923.

†"On ship" is based on value of all materials worked into the ship, and of the labor involved; "total" includes also all other materials delivered to the yard, and the work done upon them.

Amount of Steel Scrap to Be Made Available

BY SIDNEY G. KOON

IN turning our naval swords into plowshares, along the lines laid down by Secretary Hughes' proposal before the Conference on the Limitation of Armaments, Nov. 12, a scrap problem of some magnitude is developed. Approximately 85 per cent of the rated displacement of a battleship consists of steel and iron —the latter a very minor item. In addition, there is a considerable quantity of copper and brass.

It is estimated that if the project materializes the amount of steel and iron scrap, from fifteen uncompleted battleships and battle cruisers and from twenty old battleships, will be about 600,000 gross tons. While portions of such scrap would not be marketable, at $10 per ton we should have $6,000,000 scrap value—about what a single old-type battleship cost to construct.

Some approximations had to be made in estimating below the material to be obtained from ships in the early stages of construction. Thus, with six battleships of the (new) Indiana class of 43,200 tons, and about 29 per cent completed on the average, it was assumed that one-half of the remaining material was assembled or in process of fabrication. The same assumption was made with regard to the six battle cruisers of 43,500 tons, where the average percentage of completion is only about 16. For the Colorado, Washington and West Virginia, 32,600 tons each, where the average stage of completion is 72 per cent, it is fair to assume that all of the remaining structural material and armor is in hand, more especially as two of these ships are actually afloat and the third nearly ready for launching.

With the above explanation, the figures for the probable amount of scrap are given in the accompanying table. This includes five old ships which had already been listed for sale or target practice. Those ultimately assigned to the latter fate will, of course, be removed from the list of scrap producers, unless they be sunk in shallow water, in a location where they may readily be recovered for the metal they contain.

Nothing that has been said about the scrapping of cruisers, destroyers, submarines or auxiliaries would make possible a forecast of scrap quantities.

Only two of the ships listed have fire-tube boilers —the Alabama and Wisconsin having each eight single-ended boilers, arranged in two rows of four boilers. If it be desired to preserve these boilers for any purpose, such as merchant ship use, they may readily be hoisted out after a certain amount of cutting away of the decks above. All other boilers are water-tube, of such types as permit ready dis-assembly.

Of course twelve of the ships have no boilers yet installed. Those twelve were designed for a total of 1,440,000 shaft hp., which will give some indication of the size of their boiler plants. The total heating surface provided for is 1,685,000 sq. ft., besides 162,000 sq. ft. of superheating surface. The remaining 23 ships, with 440,000 hp., have boilers aggregating 1,069,000 sq. ft. of heating surface and 21,944 sq. ft. of superheating surface.

Armor accounts for about 200,000 tons of the total displacement of the 35 ships. Of this amount, some 72,000 tons will come from the 20 completed ships. About 130,000 tons was to have been put on the 15

Battleships and Battle Cruisers Proposed to Be Scrapped

Ships	Tons Displacement Unit	Tons Displacement Total	Aver. Per Cent Complete	Probable Tons Scrap
Indiana, Massachusetts, Iowa, North Carolina, Montana, South Dakota	43,200	259,200	29	142,000
Colorado, Washington, West Virginia	32,600	97,800	72	83,000
Constellation, Constitution, Lexington, Saratoga, Ranger, United States	43,500	261,000	16	129,000
Michigan, South Carolina	16,000	32,000	100	27,200
New Hampshire, Kansas, Vermont, Minnesota, Connecticut, Louisiana	16,000	96,000	100	81,600
Virginia, Rhode Island, Nebraska, Georgia, New Jersey	14,948	74,740	100	63,500
Ohio, Maine, Missouri	12,500	37,500	100	31,900
Alabama, Illinois, Wisconsin, Kentucky	11,550	46,200	100	39,300
Total 35 ships		904,440		597,500

ships under construction, of which the 25,000 tons for the Colorado, Washington and West Virginia is mostly installed. Very little, if any, of the armor for the six big battleships and the six battle cruisers has been put in place, and only a portion of the amount has been delivered to the building yards. Hence the amount of armor entering the scrap market should be far less than 200,000 tons—perhaps 150,000 tons would cover it.

Big guns, 324 in number, account for about 24,000 tons of the displacement of the 35 ships. This is the mere weight of the gun barrels. The mounts would add 16,000 tons more. But about three-fourths of these totals represent the main batteries of the 15 unfinished ships—144 16-in. guns. There is reasonable doubt as to whether, in any event, these guns would be turned into scrap. They would be readily adaptable to coast defense service. The same remarks apply to the ammunition already accumulated for these guns, and to the multitudes of smaller guns (under 8-in. bore) not included in the figures above.

Oxyacetylene and other cutting torches, such as have been used to such effect in dismantling the guns and fortifications of Heligoland, should make it possible to handle this task with celerity. Indeed, it might well glut the scrap market, if pushed as fast as mechanical possibilities permit.

And it must be recognized that none of the ships listed could well be turned to commercial use without being cut up; the hulls are too heavily built, and lack the ready accessibility to large cargo spaces which merchant vessels require. The engines are too light for commercial purposes, and are designed for power rather than for economy in fuel consumption.

Secretary Hughes Proposes United States Do a Large Part

NEW YORK, Nov. 15.—Analysis of the capital ships to be left to Great Britain, Japan and the United States, if the armament limitation plan, as outlined Nov. 12 by Secretary Hughes takes effect, shows that the United States has gone to the length of heavily handicapping her navy. Not one of the 18 ships left to this country was designed for a speed greater than 21 knots. Fourteen of the 22 British ships were designed for speeds from 22 to 31 knots, nine of them being 25 knots or better. Nine of the ten Japanese ships have speeds of 22 to 28 knots.

In gun power much the same story must be told. Just one of the American ships carries guns of more than 14-in. caliber; thirteen of the British ships carry 15-in. guns. Not one of the British ships but has a main battery of 13½-in. guns (or larger); six of the American ships have nothing heavier than 12-in. The 12-in. gun throws a shell weighing 870 lb.; the 13½-in. gun, one of 1250 lb. The destructive effect of a shell has been stated to vary about as the square of the weight. The carrying power at long range is increased also with increasing weight.

Thus the handicap of the proposed American fleet, unable through lack of speed to force an issue, and with one-third of its ships armed with guns impotent at long range, is an outstanding feature of the proposal.

Both Britain and Japan have battle cruisers. Britain has four and Japan four. We have none. If the plan as announced were so modified as to permit us to complete four of the six battle cruisers now under construction, and then to scrap four of the ships carrying 12-in. guns, it would leave each of the three powers with a group of four battle cruisers; would remove part of our inability to send out ships of a speed sufficient to keep in touch with a fast fleet; would avoid most of our gun limitation by reducing to two ships the number carrying the 12-in. gun.

Such a modification would leave the United States and Great Britain exactly equal in number of big guns; almost precisely equal in average speed, and with a difference of slightly more than 1 per cent in tonnage displacement. Our ships would still be slightly slower, on the average, than those of Japan. The table shows both proposed arrangements.

Proposed Future Fleets of Capital Ships

Class of Ship	No.	Tons Displacement Unit	Tons Displacement Group	Guns Per Ship	Guns Group	Speed
United States						
Delaware*	4	20,900	83,650	10—12-in.	40	21 Kt.
Arkansas	2	26,000	52,000	12—12-in.	24	20.5
New York*	4	27,250	109,000	10—14-in.	40	20.75
Pennsylvania*	7	32,000	223,400	12—14-in.	84	21
Maryland	1	32,600	32,600	8—16-in.	8	21
Totals	18		500,650		196	‡20.87
Lexington	4	43,500	174,000	8—16-in.	32	33.25
Totals†	18		591,000		188	‡24.15
Great Britain						
Iron Duke*	8	24,500	196,000	10—13½-in.	80	21
Resolution	5	25,750	128,750	8—15-in.	40	22
Queen Elizabeth	5	27,500	137,500	8—15-in.	40	25
Tiger	1	28,500	28,500	8—13½-in.	8	30
Renown	2	26,500	53,000	6—15-in.	12	31
Hood	1	41,200	41,200	8—15-in.	8	31.5
Totals	22		584,950		188	‡24.25
Japan						
Settsu	1	20,800	20,800	12—12-in.	12	20.5
Fuso*	4	30,900	123,600	12—14-in.	48	22.5
Nagato	1	33,800	33,800	8—16-in.	8	24
Kongo	4	27,500	110,000	8—14-in.	32	28
Totals	10		288,200		100	‡24.63

*Ships similar, but not identical, are grouped where feasible.

†Omitting four of Delaware class.

‡Weighted average.

Benefits Would More Than Offset Tonnage Loss

YOUNGSTOWN, OHIO, Nov. 15.—Benefits which would accrue to the world from reduction of naval armament, as suggested by Secretary of State Hughes, would more than offset the tonnage loss to the steel industry, in the belief of steel makers in the Mahoning Valley.

"Such a program would have no appreciable effect on the steel industry," contends President James A. Campbell of the Youngstown Sheet & Tube Co. "The steel tonnage going into naval ship building never bulked large as compared with total production. Little steel for naval purposes was ever produced in this district.

"On the contrary, the benefits from such a policy would more than compensate for any direct loss in business. Taxes would be reduced and more money would thereby become available for commercial steel. Trade throughout the world would feel a beneficial stimulus.

"I believe that repeal of the LaFollette seaman's act, making possible operation of a merchant marine under the United States flag, would far more than offset the loss of steel for marine purposes. But for this legislation the merchant marine, now rotting in our harbors, could be profitably operated. A large merchant fleet would require much steel, likewise. We need to give more attention to legislation governing our merchant fleet and less to fears over naval armament reduction."

NATIONAL FOUNDERS' MEETING

Addresses of President and Commissioner at Opening Session Wednesday

General rather than specific references to the foundry business were made in his annual address by President William H. Barr at the National Founders' Association meeting, which opened on Wednesday morning, Nov. 16, at the Hotel Astor, New York. He devoted himself largely to the conditions which have controlled in Federal legislation respecting the tariff and taxes and to the industrial relations situation as shown by the country-wide consideration of unemployment, the threatened railroad strike and the troubles in the West Virginia coal fields. What he had to say in respect to foundry matters was in part as follows:

"It would be more or less futile to analyze the causes of present foundry conditions. The economist will go back many years to find the crude causes. The politician will have his own starting point. Many foundrymen will admit freely that, before business began to change quickly, they paid little attention to fundamental economic conditions and causes. There are some broad phases, however, which must be apparent to all. The war upset world industry and finance, and inflation was followed by chaos and maladjustment. In our country, the Government took over private business and turned it back in a frightful mess. Every fundamental law of economics was discarded by the Government and, when war was concluded, we had an indescribable situation.

"In searching for a simple explanation of the basic fault of the industrial situation both before and after the war, I can only sum it up in the two words, politics and unionism.

"On the other hand, economic laws are never suspended and, consequently, the time came when the penalty had to be paid by those who were absolutely innocent of any violation. Our industry attempted to struggle back from the paternalism of political government, carrying a burden difficult to assess. To restore that industry to normal, to make it function again and to bring back the buying confidence of the metal trades is an almost superhuman task. But we are quietly proceeding back to safe ground and to a basis where we hope economic laws will function, will be respected and obeyed.

"The hope to-day is that we are gradually purging industry of politics and unionism and the after effects of war. We are bringing to this contest the grim resolution of American business men to see the thing through, and we are mightily set upon correcting the conditions which have brought about the present situation. Let us not be too analytical as to the causes which promoted the present business conditions. Rather, let us accept the situation as it is and continue to work for normalcy. It is not an impossible fight and we possess everything that tends to make for victory. We have courage, a clean record, patriotism and the will to win."

A. E. McClintock in his annual report made a plea for putting plans into action for training workers against the time of need, as when business gets into full swing and skilled help is scarce. "I am well aware," said he, "that a foundry having no orders and shut down, or operating part time with a limited force, has a feeling of obligation, and rightly so, to give first employment to former faithful employees. Nevertheless, it is highly desirable to make definite plans for educating and training operatives who will again be needed to fill that 20 or 30 per cent of future vacancies which are responsible for a very large part of the total labor turnover. It is my firm conviction that the time to formulate plans for giving elasticity to an organization is before business starts on the upgrade, and have those plans developed to admit of expansion as the needs require."

Mr. McClintock also contended that too little thought and too little attention is given to the development within the company organization of the spirit of loyalty which should and does rank ahead of ability. "With loyalty as a foundation, ability can be taught and acquired; but with disloyalty as a base, the structure is elevated on shifting sand. It is my conviction that it is not only good business, but a duty the employer owes to his men to assist them to an understanding of plain fundamental economics."

Various reports took up most of the Wednesday morning session, special addresses were provided for on Wednesday afternoon, the annual banquet occurred on Wednesday evening, and on Thursday morning addresses were scheduled on foreman training and on foundry costs.

COMING MEETINGS

November

National Founders' Association. Nov. 16 and 17. Annual meeting, Hotel Astor, New York. Secretary, J. M. Taylor, 29 South La Salle Street, Chicago.

American Iron and Steel Institute. Nov. 18. Fall meeting, Commodore Hotel, New York. H. H. Cook, assistant secretary, 61 Broadway, New York.

December

Taylor Society. Dec. 1, 2 and 3. Annual meeting, Engineering Societies Building, New York. Dr. H. S. Person, managing director, 29 West Thirty-ninth Street, New York.

American Society of Mechanical Engineers. Dec. 4 to 9, inc. Annual meeting, Engineering Societies Building, New York. Calvin W. Rice, secretary, 29 West Thirty-ninth Street, New York.

MECHANICAL ENGINEERS MEET

Elimination of Waste in Industry to Feature Annual New York Meeting of A. S. M. E.

Announcing that a 5-day annual meeting will be held in New York, Dec. 5 to 9, the American Society of Mechanical Engineers has made public a statement by Herbert Hoover saying that the investigation of industrial waste recently completed by the American Engineering Council of the Federated American Engineering Societies has paved the way for an advance in American industry. The findings of this council's Committee on Elimination of Waste in Industry will form the leading topic of discussion.

Conditions in five basic industries "assayed"—to use Mr. Hoover's description—by the committee will be discussed Dec. 5. The industries include the metal trades, printing, boots and shoes, clothing and building. In the evening will come a session on education and training in the industries.

On Dec. 6 simultaneous sessions on railroads, power, and machine shop practice will be held. Speakers at the machine shop session will include Prof. John Airey, University of Michigan, who will discuss "The Art of Milling," and J. A. Smith, General Electric Co., and J. J. Callahan, Worcester, Mass., who will speak on "Waste in Machine Industry."

Sessions on management and gas power will be held in the afternoon. In the evening the presidential address will be delivered by the retiring president, Edwin S. Carman, Cleveland. Honorary memberships will then be conferred upon Henry H. Towne and N. G. Herreshoff, yacht designer and builder.

Sessions of the fuel and material handling divisions and of the student branches of the society will be held Dec. 8. In the afternoon a joint session with the Society for the Promotion of Engineering Education will be held, on "Professional Engineering Education for the Industries." Speakers will be F. C. Pratt, vice-president General Electric Co. and president Yale Engineering Society; J. E. Otterson, president Winchester Repeating Arms Co., New Haven; Dexter S. Kimball, president-elect of the society, vice-president American Engineering Council and dean of engineering at Cornell; and Prof. A. G. Christie, Johns Hopkins. On Dec. 9 sessions of the textile, ordnance and aeronautic sections will be held. The ordnance sessions will take up the recent army demonstrations at Aberdeen, Md., where the mechanical engineers co-operated.

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Reduced Armament a Fact

Not in nineteen centuries has the world heard a more heartening message than went out from Washington on Nov. 12. The proposal of the United States for the scrapping of many of its battleships and for a 10-year holiday at navy yards is not only epoch-making; it has in it larger possibilities for the welfare of men than are contained in any state document in history. As the Washington conference is the greatest of international conferences, this paper of Secretary Hughes is the greatest utterance from such a council.

The response to the proposal has been little less a marvel than the proposal itself. At no time since the war have the American people been so nearly of one mind on any question of public policy. Variance and ill feeling, as exhibited most recently in the railroad dispute, have been so common that agreement on any matter of large import has seemed impossible. The advance comment on the armament conference showed that fear of divided counsels was in the minds of many, even though hope of a good outcome was the dominant note. But the electrical announcement of what the United States is willing to do to lift the burdens of armament from the people's backs, has united the nation in the confidence that the first day of the conference has virtually settled what will be its final decision.

This view need not be set down as unthinking optimism or as an enthusiastic reaction to a daring program. The world was not nearly so sick of war on the day of the armistice as it is to-day after three years of actual living with the problems left by the four worst years in history. The American people have come up to the Washington meeting with the conviction that if the three great sea powers allowed this opportunity to pass without definite action for the limitation of armament, they virtually would be telling the world that it is powerless to save itself from what Andrew Carnegie called "the most ferocious and yet the most futile folly of man." The main reason, therefore, for believing that the conference will do substantially what has been put before it to do is that this thing or something like it must be done if civilization is to be saved.

The response from Great Britain and Japan, which of necessity can only be expressed to-day in general terms, strengthens the belief that the conference will not disappoint the expectations of the President. There is the question of employment on naval work under way at home and abroad. It is a consideration of great importance and of many difficulties. But the way will be found and the price will be paid, because what is paid in compensation for all such losses will be far outbalanced by what is gained in stopping the waste of warships. The economic consequences of the peace of Versailles have been discussed for two and a half years in the aspect of Europe's well-nigh hopeless struggle against bankruptcy. The events of Saturday require that the economist's survey shall now deal largely with the forces set in motion at Washington that are to save the European world from bankruptcy.

Naval Armament and Steel Output

Greatly exaggerated is the common estimate of the steel industry's activities that are dependent on naval armament. In the writing that has been done in magazines and in the daily press on the effort to reduce the burdens of the nation's war establishment it is quite usual to put steel manufacturers in the list of those whose selfish interest makes them natural advocates of large appropriations for war purposes. For example, a New York paper had this in its Washington correspondence dealing with the remarkable developments of Saturday:

> Another blow was struck by Mr. Hughes at progressives and radicals of both political parties who have been whispering that the four American delegates were made to order to carry out the mandate of the Steel Trust. According to their predictions, there would be no chance of real limitation of naval programs because the steel interests make most of their money out of armor plate.

How small a fraction of the steel output of the country goes into naval armament is shown in the

analysis of the American proposals given in our Washington correspondence on other pages. It will be seen from this careful computation that 30 ships the United States would scrap, under the Hughes program, required for their construction 582,703 net tons of steel of all descriptions, including armor plate, plates, shapes, bars, pipe, rivets, forgings and castings. The finished steel output of the country in 1920 was 32,347,860 gross tons. Thus all the steel represented in the 30 vessels that are to be cut off is but 1.60 per cent of the country's production last year.

To build these 30 warships would be a matter of seven or eight years if all the eight yards in the country capable of building such vessels were to concentrate upon the work. In other words, the steel required for a year's naval program, in terms of tonnage, is only a fraction of 1 per cent of the output of American steel works. The three companies owning armor plate plants have a combined annual capacity of 33,000 gross tons, which with the Government plant at Charleston, W. Va., capacity 8000 tons, gives a total capacity in armor plate of 41,000 tons per year. No such amount of armor plate has ever been produced in a single year. The largest award ever made by the Government at one time was for 45,583 tons—the requirements of four battleships and four battle cruisers, which would probably be three years in building.

These figures are cited, not to minimize the contribution of naval construction to the steel industry. Plant requirements are not inconsiderable and many thousands of men are given work in the shops of the steel and shipbuilding companies which contract to do naval work. But the statement of the actual facts concerning the contribution made to the steel industry by the Government's naval programs serves to put in their true light the reckless assertions as to the steel trade's interest in continuing naval programs on the present scale.

The Government's outlay for the Charleston armor plate plant was probably $10,000,000 to $11,000,000. The existing private plants, built on a much lower scale of values, therefore represent but a small percentage of their total capital.

The American steel industry has been built up on the pursuits of peace. Its prosperity is a prosperity of peace. Its leaders have declared themselves as wholeheartedly in favor of President Harding's plans for the limitation of armament, relieving the American people of the fearful wastes and burdens of war expenditure. Viewed purely from the standpoint of self-interest and the largest expansion of their industry, they recognize that the constructive forces that will be released by the American proposals will mean far more in the end to steel works capital and labor than all that has ever come to them from the budgets of war.

New low records have been made in the manganese-iron alloy output of the country in recent months. An analysis of the ferromanganese and spiegeleisen production for the year to date, elsewhere in this issue, shows that no spiegeleisen has been made since July and that the ferromanganese production has declined to less than 4000 tons per month. The low point in the latter was 1509 tons in July. The slump in this industry has been more severe than that in pig iron or steel, with no recovery yet manifested. The analysis also shows that imports of British ferromanganese do not occupy the important position they once had. They have amounted to only 734 tons per month to Oct. 1, this year, whereas in 1920 they were over 4900 tons, and in 1913 over 10,500 tons per month. In the latter year British makers supplied one-half the amount consumed by American steel makers; to-day, probably less than one-fifth. Although production of ferromanganese is now considerably below the theoretical needs of the industry, due probably to the large stocks carried over from 1920, the ability to meet these needs is but latent. This was demonstrated by the remarkable outputs during the war. Liquidation in prices has been quite thorough, for the present selling price of about $60 compares with $250 to $300 during the war and with about $40 in 1914.

Where the Steel Is Going

The rate of steel ingot production in October was substantially the same as the average for the calendar year 1906. Production last month was at the rate of approximately 23,000,000 tons per annum, while the output in 1906 was 22,624,431 tons. The coincidence makes it easy to observe the great difference in the character of steel demand. Assuming that production last month was in harmony with consumption, the consumption now is totally different from that in 1906. That year stood out prominently among the years in the steel industry. It was one of the few calendar years in which there was an insistent and sustained demand. No subsequent calendar year until 1916 showed full operation of existing steel producing capacity throughout, and few preceding years had shown fully sustained production.

In 1906 there was produced 3,977,872 tons of steel rails, while rail production lately has been very light. New railroad construction in 1906 was 5623 miles, a greater length than has been laid in any year since, while there was also much laying of secondary track. There was produced 2,531,552 tons of steel plates and 2,114,053 tons of steel shapes, a large part of the demand being for the building of railroad cars. The *Railway Age* reported cars built in the United States and Canada in 1906, the Canadian output being relatively small, at 240,503 freight cars and 3167 passenger cars, while the output of locomotives was 6952. The production of rolling stock has been very light lately.

Thus railroad consumption of steel in 1906 was much larger than the consumption at the present time. The same observation can be made as to consumption of steel in factory, skyscraper and bridge construction. These lines of steel consumption have been quite inactive of late.

Very roughly speaking, the lines of steel consumption just mentioned absorbed between 40 and 50 per cent of the total steel produced in 1906,

while the same lines are now absorbing only 10 to 20 per cent at the outside of the steel production, the total steel output being substantially the same. By difference, the lines of consumption that used 50 or 60 per cent of the 1906 tonnage now absorb 80 or 90 per cent, i.e., they have increased by one-half or more. The arithmetical comparison is necessarily inexact, but it is illuminating. We are comparing 1906, when business conditions were extremely favorable, with the present time, when in most quarters it is felt that business in general is decidedly poor.

The lines which are more active now than in 1906, balancing the decrease in railroad consumption and building construction generally, include such items as pipe, sheets, wire nails and tin plate. These commodities have come into more widespread use, so that when business is relatively dull the consumption is greater than 15 years ago. Even the consumption per capita is evidently greater in most lines, for population has increased only 23 or 24 per cent since 1906.

It is no new experience, of course, for demand for certain classes of steel to fall off more than demand for other classes. The phenomenon has been exhibited more or less in all spells of slack employment for the steel industry, but the disparity is particularly marked at this time. It is obvious, therefore, that demand for steel has plenty of natural room for improvement. There is requisite not so much a large increase in the general volume of business in the country as a swing towards the lines of activity that absorb large tonnages of steel, including in particular railroad rehabilitation and development and large investment construction undertakings. The ordinary everyday consumption of steel is at a pace that is not half bad.

Fear of Foreign Competition

Since the change in our foreign trade relations due to the war those who have been trying to spread the doctrine that if we can hope to export goods we must count upon importing goods have had uphill work. The argument is that we do not want to sell goods unless we are paid for the goods, and there is no medium in which payment can be made except goods. Investments in foreign countries would do, but as a rule foreign investments do not appeal to Americans. The individual, however, is thinking of his own position, not of the position of the nation. He thinks of selling, not of buying. He has his particular goods to sell and is afraid of competition in his own market. He buys such a variety of goods that he takes no great interest in that matter. The individual cannot be severely criticised for his attitude is a very natural one.

To a great many men "merchandise imports" and "foreign competition" are practically synonymous and interchangeable terms. They would like to see imports restricted, for fear that in the imports there might be some goods which would compete with the goods they produce and wish to sell. The fact that in the assortments of goods imported there might be some which they would be glad to buy does not impress them. The testimony of the bare facts, however, does not support the idea of merchandise imports and foreign competition being in general synonymous terms. The facts, available in the form of statistics of our foreign trade, are not often consulted for verification or disproval of this idea. Below is given a presentation which should throw some light on the subject. It is constructed from the record of our merchandise imports and exports last September. The presentation ignores all countries with which we did not do a business, in either exports or imports, of a million dollars or more, except that since Africa does not furnish a single division with which we did such an amount of business the continent is taken as a whole. The point is to separate the countries with which we did more export than import business from those countries with which we did more import than export business. The first part of the table names the former countries, the second part the latter. In the first part the imports from the country are taken at 100, so that the preponderance of exports is shown. In the second part the exports to the country are taken at 100 and thus the preponderance of imports is shown. Thus last September we imported $3,025,130 from Belgium and exported to Belgium $12,769,770, or 323 per cent more, hence Belgium gets an index number of 423. Similarly, in the second table, to Switzerland we exported $605,880 and from Switzerland we imported $3,119,421, or 415 per cent more, hence Switzerland gets an index number of 515.

Proportionate Excess of Exports

Belgium	423	Scotland	151
Denmark	603	Ireland	147
Finland	364	Canada	232
France	159	Panama	340
Germany	547	Mexico	170
Italy	181	Cuba	106
Netherlands	280	Argentina	184
Norway	247	Australia	640
Spain	266	New Zealand	245
Sweden	169	Hong Kong	228
Turkey in Europe	910	Africa	216
England	383		

Proportionate Excess of Imports

Switzerland	515	British India	184
Dominican Republic	127	Straits Settlements	773
Brazil	119	Other British East Indies	730
Chile	452	Dutch East Indies	262
Colombia	251	Japan	116
China	108	Philippine Islands	125

Total imports were $179,282,568, total exports being $325,773,521, so that on the basis of imports at 100 exports were 182.

According to one conception not infrequently encountered, the countries we should be afraid of are the countries which export more to us than we export to them. If so, the second part of the above table contains a list of the countries we should be afraid of, while the countries given in the first part are harmless.

British Pig Iron and Steel Output in October

(*By Cable*)

LONDON, ENGLAND, Nov. 14.

The production of pig iron in Great Britain in October was 235,500 gross tons and that of steel ingots and castings, 405,400 tons. These compare with an output of 158,300 tons of pig iron and 429,300 tons of steel in September and with 93,600 tons of pig iron and 432,600 tons of steel in August. The average monthly output of pig iron in 1920 was 667,300 tons and of steel ingots and castings 754,700 tons.

CORRESPONDENCE

Increasing Production

To the Editor: The two letters discussing time study, which appear in the Oct. 13 issue of THE IRON AGE, contain much food for thought.

As Mr. Fitz states "to decrease manufacturing costs labor must be encouraged." The employer must go one step further, however, than setting standards which will enable the employee to earn his $10 in 8 hr. He must, with other employers, present a solid front against those outsiders whose mission in life is to form organizations the object of which is either to abolish the system which permits the workman to earn according to his ability or to compel the employer to pay the same wage to less efficient workers.

I am afraid that Mr. Blank's faith in the stop watch will never become widespread, as most operatives are convinced that it is a pace maker only. Furthermore, the stop watch demonstrates only that operations can be performed within a certain time limit and does not show the individual worker just what it is that keeps him from meeting the limit set.

It would appear that moving picture machines will have to be produced cheaply and small enough to be easily operated at close range in the machine shop. Thus the slower workman can be shown, by watching the reproduction, just how he can improve his handling of material or tools and eventually equal his more skillful colleague. This being a method which the workman cannot dispute, he supplying the evidence, and which aims at removing the cause, it will eliminate the stop watch as increased production will naturally result if the obstacles thereto are removed.

H. D. MURPHY.

Medford Hillside, Mass.
Nov. 10.

Alloy Steel for Bridges

To the Editor: Should reference not have been made in an editorial in THE IRON AGE, Nov. 3, to the use of nickel steel in the Quebec bridge? The employment of this material in the bridge enabled it to be constructed in a much lighter form and probably had much to do with the success of the last attempt to erect it. The same material was also used in the St. Louis municipal bridge over the Mississippi, in the Kansas City viaduct and bridge over the Missouri, and for the emergency dam, locks and spillway of the Panama Canal. It has been estimated that for bridges and similar structural work the saving in weight from the use of nickel steel amounts to from 10 to 30 per cent and in cost to 12 per cent.

STEEL.

Toronto, Canada, Nov. 12.

Steel Shipments by Boat

ST. LOUIS, Nov. 15.—Bringing between 500 and 600 tons of nails and barbed wire, the towboat Transporter of the Water Transport Co. reached St. Louis last Friday, completing the first water movement of freight from Pittsburgh to St. Louis in many years, and is now on her way back. The boat made the trip in 12 days. The return trip will be empty, no St. Louis freight having been found. However, the boat will continue to carry freight to St. Louis in the hope that a return business eventually will be upbuilded. The next sailing from Pittsburgh will be Sunday.

The Transporter left Pittsburgh with seven barges loaded with steel products. One was dropped at Huntington, W. Va., two at Louisville, three at Evansville, the seventh coming to St. Louis.

A meeting on industrial management problems is to be held at the rooms of the Providence Engineering Society, Providence, R. I., on the evening of Dec. 6 at which L. J. Young, manager efficiency and standards department, Sayles Finishing Plants, will deliver the leading address.

Tonnage Wages Reduced

Tonnage rates of sheet mill workers operating under the sliding scale of the Amalgamated Association of Iron, Steel and Tin Workers, will be reduced 8 per cent for the November-December period from the rates paid in September and October, as a result of the bimonthly settlement conducted Nov. 10 at Youngstown, Ohio.

Examination of sales sheets submitted by mid-Western independent makers affiliated with the Western Sheet and Tin Plate Manufacturers' Association revealed an average selling price of 2.75c. per lb., on shipments of Nos. 26, 27 and 28 gage black sheets during the previous 60 days. This is a decline from 3.10c., the average disclosed two months before. Under the new rates, employees of union sheet mills will still be 18 per cent above base. Their peak tonnage rates reached 109½ per cent above base.

Tin plate was unchanged at $5 per base box and rates of affected workers will thereby continue without change. Inasmuch as tin plate is now moving at $4.75, workers in tin plate mills will suffer a proportionate reduction in tonnage rates at the next settlement.

The examination, the last for 1921, was conducted by James H. Nutt of Youngstown, acting for the manufacturers, and M. F. Tighe, president of the Amalgamated Association, representing the employees.

Standard Bolt Co. Purchased

The Standard Bolt Corporation of Delaware has purchased the plant and property of the Standard Bolt Co., Columbus, Ohio. The new company has an authorized capital stock of $2,500,000 preferred stock and 25,000 shares of no par common stock. J. C. Burns, who has been the vice-president and general manager of the Standard Bolt Co. since its organization, will be the president and general manager of the new company. The other officers will be Harley E. Burns, vice-president and secretary, and Robert R. Vance, treasurer. The plant will be operated as heretofore and the change, while an actual purchase of the plant, is in reality practically an inside change whereby the controlling interest passes to J. C. Burns and Harley E. Burns. The new company expects to make changes and extensions in several of the departments of the business as soon as general business conditions in the country have advanced to a point to justify it.

Will Promote Foreign Trade

The Novo Engine Co., Lansing, Mich., has announced that the Associated Machinery Corporation has been organized in conjunction with three other noncompeting companies for the purpose of promoting foreign trade. The other companies are the Pawling & Harnischfeger Co., Milwaukee, the Insley Mfg. Co. Indianapolis, and the Chain Belt Co., Milwaukee. These concerns have a growing trade in India, Ceylon and Burmah. The officers of the new company are: Henry Harnischfeger, president; Clarence E. Bement, of the Novo company, vice-president; and Clifford E. Messenger, secretary-treasurer. Lionel R. Vinall-Moon is the managing director in India and Charles L. Langlotz is manager of the New York office.

Taxpayers Granted Extension

WASHINGTON, Nov. 15.—The Commissioner of Internal Revenue has just issued a decision extending from Nov. 24 to Jan. 15, the time in which taxpayers may file amended returns in preparation of income and profits tax for 1917 and subsequent years where they have used appreciated or inflated values in determining the amount of invested capital. Acting upon the Supreme Court decision in Labelle Iron Works case, the Treasury Department had required on Aug. 26 that such returns be made within 90 days or by Nov. 24. The extension of time was allowed by the new decision because many taxpayers were unable to complete returns in the time proposed.

MOLDING SAND

Conservatism Discussed at Chicago—Joint Committee Will Investigate

The disposal of old molding sand is often one of the most serious problems confronting a foundry. Where space is not available for dumping, the removal of used sand often involves considerable expense. In some cases this difficulty has been overcome by reclaiming the sand and using it again in molds. Successful reclamation, however, demands careful study of the physical properties of the sand, the added elements and the process required to make it suitable for reuse and other considerations. Investigations by H. M. Lane in the Detroit district indicated what might be accomplished both by washing and dry cleaning old sand, while research by H. B. Hanley and R. F. Harrington in the East showed results which might be achieved by adding clay or a new sand with an unusually heavy bond to provide the bond for used molding sand. In general, however, the methods employed in using molding sand and selecting the sand to be used have been of a haphazard character. Foundries which have gone to the trouble of making analyses of the sand they use, have found wide variations both in the physical and chemical properties of material coming from the same pits.

Joint Committee Formed

Believing that much can be gained by investigating the subject of molding sand with the end in view of arriving at standard methods of testing molding sand and classifying it into grades according to its bond, refractory qualities, permeability, fineness, etc., a joint committee of the American Foundrymen's Association and the engineering division the National Research Council has been formed.

To sound out the sentiment of the foundry industry on the work which has been undertaken and to secure the maximum of co-operative effort, a series of meetings will be held at which the subject will be presented to local foundrymen's associations. The first of these was a meeting of the Chicago Foundrymen's Club at Chicago on Nov. 12, which was addressed by R. E. Kennedy, assistant secretary of the American Foundrymen's Association and also secretary of the joint committee of that body and the engineering division of the National Research Council. Thus far comprehensive bibliographies of literature on molding sand as well as refractories have been prepared and the committee now finds itself in a position where it believes it desirable to ascertain how far the foundry trade would desire the investigation to go and to what extent it will actively co-operate in supplying data covering practical experience in the use and reclamation of molding sand. Mr. Kennedy pointed out that the State of Illinois was ready to make a survey of the sands of the State but could not proceed because there are no standard tests for sands and no recognized methods of grading them. Physical analysis, he asserted, was more important than ascertaining the chemical properties of molding sand, as sands with same chemical analysis would give widely different results in molding work. He described some of the physical tests used but pointed out that there are differences of opinion as to their value. The matter of keeping costs of sand used for molding is alone worthy of consideration—something which has been too often ignored by foundries.

Mechanical Preparation

Mechanical preparation of molding sand, the speaker said, had been developed intensively by the Germans with the result that they produce castings with better surface than the English who have much better grades of sand to work with. Intelligent mixing of old and new sands, or clay, offers an opportunity for economy as well as for a better product. Sands containing the same proportion of clay may have different properties because in the one case the clay is plastic and in the other it is not. In England sand is available which contains considerable iron hydroxide which increases its bonding characteristics and to this sand is attributed the superior finish on the British steel castings. Investigation which would result in ascertaining how to prepare a synthetic molding sand containing same desirable qualities would be invaluable. Much is to be gained by finding out the proper amount of water to add to molding sand. Certain research shows that the addition of four per cent water to a certain molding sand gives the best results; yet a sand may hold much more moisture than the amount at which it is best for use and test of the sands used by the best molders indicate wide variations in moisture content owing to their dependence on the sense of touch to determine the proper degree of wetness.

Further Improvement in Fabricated Steel

The October volume of contracting in fabricated structural steel work totaled 97,800 tons, according to the records collected by George E. Gifford, secretary Bridge Builders' and Structural Society, New York, or the largest amount since May, 1920. February marked the low point in the period since then. For that month the amount of business taken by the bridge and structural shops of the country did not correspond to over 14 per cent of capacity. For the next three months the average rate of contracting was about 30 per cent of shop capacity. The succeeding three months brought the percentage average to 35, and then in September bookings represented 48 per cent and the October figures about 54 per cent.

How lean a year 1921 is for the fabricating trade may be indicated by noting that for the first ten months of the leanest year of the last decade, 1913, the total volume of business was about 911,000 tons, while for the ten months of 1921 the total is less than 587,000 tons.

Dismantling Sharon Plant

Work has been started on the dismantling of the Sharon, Pa., plant of the Carnegie Steel Co., originally built by Sharon capital in 1896 and subsequently acquired by the Carnegie company. The bar mill machinery will be stored, although equipment of the other units will be scrapped. Buildings housing the machinery will be leveled. All open-hearth stock will be utilized at the Farrell works of the company nearby. The blast furnace at the Sharon plant will be started as soon as the pig iron market improves and operated until materials on hand are consumed, when it will be scrapped, according to present plans. The Carnegie company has been acquiring substantial land holdings at New Castle, Pa., within recent years and according to reports plans erection of a by-product coke plant to serve furnaces at Youngstown and New Castle.

At the annual meeting of the stockholders of the Carbon Steel Co. on Nov. 14 the following directors were unanimously re-elected: Charles McKnight, D. R. Wilson, C. F. Blue, Jr., W. D. Uptegraff, J. Ramsey Speer, A. L. Humphrey and F. C. Neale. Later the directors elected the following officers: Charles McKnight, president; D. R. Wilson, vice-president and treasurer; C. F. Blue, Jr., vice-president and general sales agent; W. W. Noble, secretary and assistant general sales agent; H. C. Fetzer, assistant treasurer.

The Iron & Ore Corporation of America, 11 Broadway, exporter and importer of ore, ferroalloys and semi-finished material, and William H. Muller & Co., 44 Beaver Street, New York, importers of foreign ores, have removed to the nineteenth floor of the Bowling Green Building, 11 Broadway, which the two companies are occupying jointly. There has been no change in the personnel of the companies.

The National Tube Co. is blowing in this week another blast furnace of its McKeesport, Pa., group, making three active at that plant.

AUSTRIA PARALLELS GERMANY

Heavy Buying Empties Warehouses—Exports Decrease—Foreign Customs Rates Responsible

(*Special Correspondence*)

VIENNA, AUSTRIA, Oct. 24.—The heavy buying which began in Germany several weeks ago has spread to Austrian markets with the result that warehouses have disposed of most of their stocks. There is now a real scarcity of material; the Alpine works is in arrears with deliveries caused by a temporary breakdown and shipments from Germany are moving slowly. Terms of delivery stipulated by the smaller mills average 10 weeks. The trend of prices is parallel to the developments in the German market. Compared with the August price of 3000 kronen per 100 kg. for bar iron, the Alpine works is now quoting 5000 kronen and Czecho-Slovakian works advanced pig iron prices by 40 kronen to 240 kronen some time ago.

The present buying activity is largely speculative, however, and cannot be regarded as a reliable sign of improved industrial conditions. Export business has lately decreased despite further deterioration of the currency, compelling works to concentrate their attention on the domestic market for the present. Decline in exports is held to be the result of the prohibitive customs rates introduced by the border countries. A movement is now under way to have the government invest in industry on a larger scale with a view to finding employment for the various branches of industry. Investments are particularly needed in railroads where government orders have been confined to limited quantities of machine tools and other material. Rolling stock is in need of replacement and no orders for rails and track supplies have been awarded for some time past. Repair work in the State-owned shops is progressing slowly but bids by private interests for locomotive repairs have not been considered as yet. The condition of the railroads is bad but it is difficult to see how and where the State will procure the required capital for a thorough reorganization.

Magnesite Exports

Magnesite exports during the first six months of 1921 were 40,000 tons compared with a total of 62,530 tons shipped in 1920. The corresponding figures for ore exports are 65,870 tons in the first half of 1921 and 126,854 tons in 1920. Other export figures for the first half of 1921 are: Metal ware, 3150 tons; machinery, 24,300 tons; electrical supplies, 3145 tons.

There is little activity in private building but co-operative building societies have been established, in the formation of which the iron industry is taking an active part, as instanced by the Bleckmann steel works. The primary object of these enterprises is the erection of workmen's dwellings at industrial centers and it is hoped that the attendant demand for building materials will revive the building market.

The Wöllersdorf plant, the largest State-owned munition works during the war, with the co-operation of Dutch capital, an international banking institute at Amsterdam and a new Austrian joint stock company, formed by a Dutch-German consortium, will be taken over and incorporated with 1,500,000,000 kronen capital. Locomotives will figure prominently in the production of the company and the plant will probably be extended by the addition of a steel works and foundries.

Business done at the first Vienna International Fair was on the whole satisfactory. Special machinery, such as drilling machines, shoe factory equipment, scales, household machinery, etc., were most in demand. Luxuries were rather neglected, shown by the insignificant turnover in expensive passenger cars but substantial deals were closed with American buyers of precious metal ware. Motor trucks, cutlery, kitchen utensils, hardware and other utility goods sold well.

CZECHO-SLOVAKIA IMPROVES

With Price Bottom Reached, Japanese, Chinese and Russian Orders for Bars, Rails and Sheets Are Booked

(*Special Correspondence*)

PRAGUE, CZECHO-SLOVAKIA, Oct. 22.—The continuous downward trend of the iron and steel market has apparently come to a halt but the situation is still far from improved. Coke has been reduced to 72 kronen per 100 kg. but this advantage may soon be offset by higher coal prices. The financial position of industry is unsatisfactory. Not only does the government owe large sums to the iron works but payments to rolling stock manufacturers and other customers of the iron and steel industry are slow, compelling the latter to extend considerable credit.

Practically all works are carrying large stocks, and are anxious to book orders to continue operation. It is doubtlessly because of this that some business has latterly been booked which would otherwise have gone to Belgian or German mills, Czecho-Slovakian producers being at present in a position to effect prompt shipments.

During the first half of October, the joint sales bureau of the Amalgamated Iron Works at Prague has been awarded orders amounting to several thousand carloads of iron bars, rails and sheets for shipment to Japan, China, the British colonies and Russia through the agency of German export firms. The margin of profit is stated to be very narrow. Recently the Soviet government placed an order for light plates totaling 6,000,000 kronen, of which 1,000,000 kronen have been paid as a first instalment. Several hundred carloads of rolled products have also been ordered by Germany for domestic consumption because of the inability of German mills to deliver. Germany has also placed orders for steel river craft required in the reconstruction of the Elbe River fleet, of which a certain percentage was surrendered to Czecho-Slovakia. The cost of one vessel, which is to have a capacity of 600 tons, will be about 1,250,000 kronen.

Further French Industrial Control

A feature in the engineering industry is the combination of the Skoda works and the United Machine Works Co. at Smichow. The Skoda works sold its machine shops during the war to the United Machine Works Co., which operated the Ringhoffer, Bromovsky and Ruston works. As the Schneider-Creusot interests in France is the largest shareholder in the Skoda works, the biggest Czecho-Slovakian engineering company is now controlled by French capital. The closer connection with the machine industry has evidently been effected with a view to pushing export business. The Skoda works has added new lines of production to their post-bellum program and are now manufacturing railroad material and rolling stock; spare parts for mining and smelting machinery, rolls, gearwheels, tires, carwheel sets, axles, etc.

Machinery not produced within the country is extended special customs facilities by a law in force Aug. 12. Reduction of rates or exemption from duty is provided for on machinery, tools, machine parts, plant equipment, new or used, if required in building up new industries or in the introduction of new manufacturing methods or in any other exceptional cases. The law will remain in force until 1923.

The R. E. Kidder Co., 35 Harmon Street, woodworking machinery, automobile parts and envelope-cutting presses, and the Taylor Brass Foundry, 288 Grove Street, Worcester, Mass., are to consolidate as the Taylor-Brown Mfg. Co., a new Massachusetts corporation, with a capital of $100,000. William H. Brown is president and general manager of the new company, and Walter B. Taylor, vice-president and treasurer. The new company, for the time being, will carry on the business at the two respective plants, but eventually will unite both under one roof.

Iron and Steel Markets

A CONSTRUCTIVE FORCE

The Steel Trade Favorable to Reduced Armament

Car Buying the Chief Factor in an Otherwise Quiet Market

Considered purely from the standpoint of ultimate benefit to the industry, the disarmament program has made a favorable appeal to manufacturers of steel in a week of general quietness. Naval construction calls for far less steel than is commonly thought—in tonnage only a fraction of 1 per cent of a year's output. It is true that the forge and machine shops of the three private armor plate and ordnance plants employ some thousands of men and that their communities would suffer for a time, as would various shipyards. But ultimately the steel industry as a whole would profit by the large release of labor and of tax money for merchant shipbuilding and other purposes of peace.

Features of the week having a direct bearing on the iron and steel market have been a slowing down of buying and an easing off in prices, with some reduction in mill operations. The remaining six weeks of the year, it is evident, will make a better showing in mill output than in new business put on the books.

Car work is still the most promising factor in the new buying. The Santa Fe has placed 2500 cars and the Illinois Central 1000. The latter is expected to close for an additional 3000 this week and to put out inquiries for 1000 more. The Alabama, Tennessee & Northern has closed for 300 and the Rio Grande for 700. The Burlington program calls for 7300 freight cars, 127 passenger cars and 55 locomotives. The Seaboard is inquiring for 400 cars and the Lackawanna for 500.

About 120,000 tons of steel will go to Chicago district mills for the cars just placed and under inquiry. Repair contracts let and pending cover 2400 cars.

The weakening of prices noticed this month represents the effort of the mills to keep up the operating rate of late October, a concession of $1 or $2 per ton being more than made up by the lower cost of fuller schedules.

The sheet mills' bi-monthly settlement with the workers confirms repeated reports of low prices, the average for September and October being 2.75c. for No. 28 black.

While there is little early shipment business in tin plates, some good orders have been taken for delivery in the early months of 1922, pointing to larger winter operations than in four years.

From a booking rate of 14 per cent of capacity in February, the fabricating trade has improved until for October new business went to 54 per cent of capacity. The three months following February averaged about 30 per cent and the succeeding three months about 35 per cent, with September at 48 per cent. The leanness of 1921 appears from the 587,000 tons contracted for in ten months against 911,000 tons for the corresponding ten months of 1913, the lightest year in fabricated steel work in the last decade.

Pipe orders are more satisfactory in point of volume than of price. Line pipe business in particular has developed weakness. A pending contract is for 183 miles of 8-in. pipe for the Humphrey field.

While demand for cast iron pipe has dropped off with the approach of winter, it is still considerable. Some makers have advanced from $3 to $4 the differential between 6-in. and 4-in. pipe.

The selling by a leading Southern merchant company of several thousand tons of pig iron on a basis of $18, Birmingham, has put the market down to that point, a decline of $1. Most of that sold was iron which melters had not taken on contract. A Buffalo radiator company bought 4000 tons of foundry iron and a Wisconsin melter has placed 6000 tons of foundry and charcoal grades. At Pittsburgh, foundry and malleable irons have declined 50c. and basic shows a tendency toward weakness.

In the warehouse trade reductions of $2 to $3 per ton have been made lately on various products, in recognition of the trend of mill prices.

The list of freight reductions grows. Rates on zinc and lead from the Mississippi River to the Atlantic seaboard are to be lowered from 49c. to about 35c. per 100 lb., effective around Dec. 10.

THE IRON AGE composite for finished steel, now at 2.113c. per lb., is 25 per cent above the average for the ten years before the war. The pig iron composite price has shaded off to $19.81 per ton. Unlike the price of steel, which has been gradually descending since July, 1920, the pig iron composite reached a minimum in the middle of August at $18.51, but rose again to $20.10 in September, with a subsequent downward change of only 29 cents in the seven weeks.

Pittsburgh

PITTSBURGH, Nov. 15.

The iron and steel industry takes a hopeful view of the naval construction policy proposed by Secretary of State Hughes, at the disarmament conference in Washington, but finds little to be cheerful about with regard to current business and current prices. The trade takes quite the opposite view to that of Wall Street on the effect of the disarmament proposals on the demand for steel. With the nations of the world cutting off expenditures for military purposes, it is held that taxation burdens will be lightened and industry will go forward in peaceful lines with much more vigor than otherwise would be possible. Naval construction calls for very much less steel than is popularly supposed, and it is a well-established fact that the manufacture of armor plate is not highly profitable.

The present condition of the iron and steel market is one of quietness, generally, tapering demands and steel plant operations, and weakening prices. In the reaction in operations, the Steel Corporation seems to be suffering less than the independents. The American Sheet & Tin Plate Co. has its steel works at Vandergrift, Pa., running full, and last week finishing mill operations averaged close to 80 per cent in sheet mills

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Nov. 15, 1921	Nov. 8, 1921	Oct. 18, 1921	Nov. 16, 1920
No. 2X, Philadelphia‡	$22.84	$22.84	$22.40	$44.79
No. 2, Valley furnace†	*20.50*	21.00	21.00	39.00
No. 2, Southern, Cin'ti†	22.50	23.50	23.50	42.50
No. 2, Birmingham, Ala †	*18.00*	19.00	19.00	38.00
No. 2 foundry, Chicago*	21.00	21.00	21.00	40.00
Basic, del'd, eastern Pa	20.50	20.50	20.50	41.16
Basic, Valley furnace	19.00	19.00	19.25	37.50
Bessemer, Pittsburgh	21.96	21.96	21.96	41.96
Malleable, Chicago*	21.00	21.00	21.00	40.50
Malleable, Valley	*20.00*	20.50	20.50	40.00
Gray forge, Pittsburgh	21.96	21.96	21.96	39.96
L. S. charcoal, Chicago	31.50	31.50	31.50	53.50
Ferromanganese, del'd	60.00	60.00	60.00	140.00
Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$40.00	$40.00	$47.00	$57.00
Bess. billets, Pittsburgh	29.00	29.00	29.00	50.00
O.-h. billets, Pittsburgh	29.00	29.00	29.00	50.00
O.-h. sheet bars, P'gh	30.00	30.00	30.00	60.00
Forging billets, base, P'gh.	35.00	35.00	35.00	60.00
O.-h. billets, Phila	34.74	34.74	35.74	55.74
Wire rods, Pittsburgh	40.00	40.00	40.00	70.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb	1.60	1.60	1.60	3.25
Light rails at mill	*1.55*	1.65	1.70	3.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	1.95	1.95	1.95	4.60
Iron bars, Chicago	*1.65*	1.75	1.75	3.75
Steel bars, Pittsburgh	1.50	1.50	1.50	3.00
Steel bars, Chicago	1.75	1.75	1.75	3.38
Steel bars, New York	1.80	1.80	1.88	3.38
Tank plates, Pittsburgh	1.50	1.50	1.60	2.85
Tank plates, Chicago	1.75	1.75	1.75	3.23
Tank plates, New York	1.88	1.88	1.98	3.38
Beams, Pittsburgh	1.50	1.50	1.60	3.00
Beams, Chicago	1.75	1.75	1.75	2.83
Beams, New York	1.88	1.88	1.98	3.38
Steel hoops, Pittsburgh	2.25	2.25	2.25	4.00

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Nov. 15, 1921 Cents	Nov. 8, 1921 Cents	Oct. 18, 1921 Cents	Nov. 16, 1920 Cents
Sheets, black, No. 28, P'gh.	*2.75*	2.90	3.00	6.00
Sheets, galv., No. 28, P'gh.	*3.75*	3.90	4.00	7.25
Sheets, blue an'l'd, 9 & 10.	2.25	2.25	2.25	4.75
Wire nails, Pittsburgh	2.90	2.90	2.90	4.25
Plain wire, Pittsburgh	2.60	2.60	2.60	3.75
Barbed wire, galv., P'gh.	3.55	3.55	3.55	4.45
Tin plate, 100-lb. box, P'gh.	$4.75	$4.75	$5.00	$7.50
Old Material, Per Gross Ton:				
Carwheels, Chicago	**$17.00**	$16.00	$16.50	$33.00
Carwheels, Philadelphia	*17.00*	17.50	17.00	38.00
Heavy steel scrap, P'gh	14.50	14.50	14.50	23.00
Heavy steel scrap, Phila	12.00	12.00	12.00	19.00
Heavy steel scrap, Ch'go	12.00	12.00	12.00	18.50
No. 1 cast, Pittsburgh	17.50	17.50	17.50	35.00
No. 1 cast, Philadelphia	17.50	17.50	17.50	34.00
No. 1 cast, Ch'go (net ton)	13.75	13.75	14.00	22.00
No. 1 RR. wrot, Phila	16.50	16.50	16.00	24.50
No. 1 RR. wrot, Ch'go (net)	12.50	12.50	13.00	16.50
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$3.00	$3.00	$3.25	$8.00
Foundry coke, prompt	4.25	4.25	4.25	9.00
Non-Ferrous Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	13.25	13.25	13.00	14.75
Electrolytic copper, N. Y.	**13.00**	12.75	12.75	14.75
Zinc, St. Louis	*4.72½*	4.75	4.60	6.35
Zinc, New York	*5.22½*	5.25	5.10	6.80
Lead, St. Louis	*4.35*	4.40	4.40	6.37½
Lead, New York	4.70	4.70	4.70	6.50
Tin, New York	*28.50*	28.62½	28.50	37.00
Antimony (Asiatic), N. Y.	*4.65*	4.75	4.85	6.00

*The average switching charge for delivery to foundries in the Chicago district is 70c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, Nov. 15, 1921, Finished Steel, 2.113c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel.

Nov. 8, 1921,	2.134c.
Oct. 18, 1921,	2.221c.
Nov. 16, 1920,	3.653c.
10-year pre-war average,	1.684c.

Composite Price, Nov. 15, 1921, Pig Iron, $19.81 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

Nov. 8, 1921,	$19.97
Oct. 18, 1921,	20.03
Nov. 16, 1920,	39.22
10-year pre-war average,	15.72

and approximately 60 per cent in tin plate. The American Steel & Wire Co. has nine of its 13 open-hearth furnaces at Donora, Pa., in operation, and two of the four blast furnaces in this district making iron. The Carnegie Steel Co. is averaging about 35 to 40 per cent operation of ingot capacity, and has 21 blast furnaces in operation. The National Tube Co. has put on a blast furnace at its McKeesport, Pa., works, bringing the number of active stacks at that plant to three. Altogether 47 furnaces of the 140 merchant and steel works stacks in this and nearby districts now are making iron, and the Steel Corporation subsidiaries account for 26 of the total. A Pittsburgh district independent, which recently was operating at a 50 per cent rate in its open-hearth department, this week is idle in that portion of its plant, while we note a loss of three active open-hearth furnaces by a Youngstown steel company, the active units of which have dropped from nine to six. Independent operations, taking in blast furnaces, steel works and finishing mills, are in the neighborhood of 40 per cent of capacity. The week has brought a definitely lower market in foundry iron, a sale of a fair-sized lot of No. 2 plain to a sanitary ware manufacturing company having been made at $20.50, Valley furnace, as compared with a former nominal quotation of $21. The trend of prices of the steel-making grades is down, but there has not been enough interest to establish the new prices. The scrap market also has a weaker tendency and the fuel market is largely a buyers' affair. Weakness of a most pronounced sort still is noted in the heavy products, it being reported that beams have sold at 1.50c., Buffalo, by a Buffalo mill, while 3/16-in. plates have sold at 1.50c., Pittsburgh, from a mill which has a freight to absorb of 18c. per 100 lb. The going market on steel bars is not quotable at above 1.50c., except for retail lots. The week has developed definite quotations of 2.75c. on black sheets, and 3.75c. on galvanized sheets, a recession of $5 per ton from the stabilized level of early September, and $10 a ton from the prices one or two mills attempted to obtain about a month ago. The Steel Corporation is meeting competition on light rails which now are not quotable at higher than 1.65c, base.

Pig Iron.—Prices are slipping, and only the appearance of a sizable inquiry is necessary to establish the truth of this assertion. One steel maker is offering basic iron at $19, Valley furnace, and most of the others, who hitherto have not been interested at less than $20, now are open to offers of less. A considerable tonnage of resale iron, basic grade, is being offered through brokers who, if unable to obtain more, are allowed to dispose of this iron at $18.50, Valley furnace. There is much mystery as to the location of a lot of iron, amounting to about 20,000 tons, but the common belief is that it is an accumulation of one of the railroad equipment companies outside the Valley district which apparently has no need for the iron or figures on being able to replace it later at $18.50 or less. There have been no sales and consequently we still quote the market at $19, Valley furnace, the basis of the last previous transaction. Bessemer iron is firmly pegged at $20, Valley furnace, and a few carloads have been

moved at that figure. On foundry iron $20.50, Valley furnace, has been reached on a fair-sized tonnage purchased by a sanitary manufacturing company, this same interest having also purchased 500 tons of No. 2 iron at $18, Birmingham, the iron to go to its Southern plant. Some makers still are quoting $21, Valley furnace, for No. 2 iron, but only carload lots, and few of those, have been moved at that figure.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.96 per gross ton:

Basic	$19.00
Bessemer	20.00
Gray forge	20.00
No. 2 foundry	20.50
No. 3 foundry	20.00
Malleable	20.00

Ferroalloys.—Demand is purely hand-to-mouth with few individual inquiries of more than a carload. Consumers of 50 per cent ferrosilicon are generally covered against their requirements for the remainder of the year and about the only business passing is the specifying against options secured a few weeks ago carrying a price of about $57 delivered. A few carloads of Bessemer ferrosilicon are wanted. Interest in ferromanganese is small. Both domestic and English makers are quoting 80 per cent material at $58.35, Atlantic seaboard, or slightly below $65 delivered this district, but consumers still insist that they do not have to go that high to secure supplies. No business recently has been done in spiegeleisen in this district. Production of this alloy has been nil for several months, but supplies still are available at about $30 delivered for 20 per cent material. Makers have found liquidations of their stocks difficult owing to a light demand.

We quote 78 to 82 per cent domestic ferromanganese at $60 to $65 delivered; 78 to 82 per cent foreign ferromanganese, $53.28 to $58.35, c.i.f. Atlantic seaboard. We quote average 20 per cent spiegeleisen at $30 delivered, Pittsburgh or Valleys; 50 per cent ferrosilicon, domestic, $55 to $57, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $38.50; 11 per cent, $41.80; 12 per cent, $45.10; 13 per cent, $49.10; 14 per cent, $54.10; silvery iron, 6 per cent, $27; 7 per cent, $28; 8 per cent, $29.50; 9 per cent, $31.50; 10 per cent, $33.50; 11 per cent, $36; 12 per cent, $38.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Billets, Sheet Bars and Slabs.—There is an easier tendency to prices, this being evident upon the appearance of sizable inquiries. The New York Central Railroad recently was able to develop a price of $32 on forging billets as against the recent asking price of $35. We note some carload sales of forging billets at the latter price, but evidently less is asked against fair-sized tonnages. The common asking price on rerolling billets is $30, but only small lots are bringing that price and $28 to $29, Pittsburgh or Youngstown, appears to be a fair appraisal of what could be done on sizable lots. Open market activities in sheet bars are limited, but the Steel Corporation is reported to be lining up some of its regular business from tin plate makers which it has served for some time past. On such business as has recently been done there is no basis for a higher price than $30.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $28 to $30; 2 x 2-in. billets, $30; Bessemer and open-hearth sheet bars, $30; slabs, $30; forging billets, ordinary carbons, $34 to $35, all f.o.b. Youngstown or Pittsburgh mills.

Wire Rods.—Consumers are making very few purchases and specifications against contracts are not as heavy as could be desired. Some makers still are asking $41 for No. 5 soft rods, but $40 is as high as any recent business has been done by makers in this district. Prices are given on page 1306.

Wire Products.—The expected advance by the American Steel & Wire Co. has not yet materialized and since the response to the drive for business was disappointing, there is some question as to whether any advance now will be made. Contracts made with jobbers early in September expire today, and probably will be renewed around the old price bases of $2.50 for plain wire and $2.75 for nails or at prices at time of shipment. Observance of the Sept. 12 prices of $2.60 for wire and $2.90 for nails have not been at all rigid and it is noted that a Pittsburgh independent as recently as last week quoted $2.75 on nails against a small inquiry from the New York Central Railroad. The chief hindrance to an advance at this time is the fact that few jobbers or manufacturers have specified fully against their September commitments, and cancellation is unlikely on the part of the buyers because of low prices or on the part of manufacturers because of the desire for business.

We quote wire nails at $2.90 base per keg, Pittsburgh, and bright basic and Bessemer wire at $2.60 base per 100 lb., Pittsburgh.

Structural Material.—A fair number of awards of fabricated steel still are being made, but none of those recently taken by Pittsburgh shops reach 1000 tons. The McClintic-Marshall Co. has taken 700 tons for a seven-story addition to the building of the Frick & Lindsey Co., Pittsburgh, North Side; 336 tons for the Military Avenue subway, Detroit; 170 tons for an addition to the grand stand of the Washington American League baseball team, Washington; 300 tons of miscellaneous steel for the Tin Plate Co. of India at Jamshedpur, India, and four 100-ft. deck plate girder spans for the Big Four Railroad for erection at Worthington, Ind., about 364 tons being involved. The Memphis Steel Construction Co. has taken 250 tons for a theater in Braddock, Pa., for the Braddock Theater Co. The Lackawanna Bridge Co. was low bidder for the Perry Street and Louisiana Street viaducts, Buffalo. These viaducts will take 2000 tons of steel. Attractive tonnages of structural beams are increasingly easy to place at 1.50c., Pittsburgh, and some makers are quoting that price at mills. On small tonnages the market is quotable at 1.55c. to 1.60c. Prices are given on page 1306.

Plates.—Buyers are experiencing little or no difficulty in covering their requirements at 1.50c. and any higher price refers to retail tonnages. The principal demand is from the tank builders, who lately have been getting a good many orders, especially from the Mexica field in Texas. The Riter-Conley Co. recently took 40 55,000-barrel tanks from various oil fields. About 6500 tons of plates will be used on these tanks, but the company already has covered on a considerable portion of the required tonnage. The Memphis Steel Construction Co. has taken a small tank for the New England Oil Refining Co. for which about 100 tons of plates will be required. The Pure Oil Co. recently placed nine 55,000-barrel tanks with a Columbus, Ohio, builder. The Republic Iron & Steel Co. put on its plate mill this week, after several weeks' idleness, but the purpose is to roll wide skelp for large outside diameter pipe.

We quote sheared plates, ¼ in. and heavier, tank quality, at 1.50c. to 1.65c. f.o.b. Pittsburgh.

Steel Rails.—The old base of 1.75c. on light rails has disappeared, as the Steel Corporation no longer is quoting this price and now is accepting business at 1.65c. Independents also are quoting 1.65c. base, but have not let orders carrying $1 to $2 per ton less get away. Rails rolled from old standard sections no longer are quotable at higher than 1.55c. Demand on the whole is light, even for this time of year.

We quote 25 to 45-lb. sections, rolled from new steel, 1.55c. to 1.65c. base; rolled from old rails, 1.50c. to 1.55c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Iron and Steel Bars.—The market on merchant bars now is quotable at 1.60c., Pittsburgh, for small lots, and 1.50c. for tonnages which will provide a rolling schedule. The Steel Corporation does not admit having abandoned 1.65c., base, but it is well established that it is meeting competition rather than suffer the loss of customers, and its competitors, with few exceptions, will go to 1.50c. on desirable business. The same range applies to reinforcing bars rolled from new billets, and this means that mills rolling these bars from old rails must go below 1.50c. to secure business. Makers of iron bars still are quoting 2.15c. to 2.25c. base for carloads, but firm offers of 2c. are getting consideration.

We quote steel bars rolled from billets at 1.50c. to 1.60c.; reinforcing bars, rolled from billets, 1.50c. to 1.60c. base; reinforcing bars, rolled from old rails, 1.45c. to 1.50c.; refined iron bars, 2c. to 2.25c. in carloads, f.o.b. mill, Pittsburgh.

Iron and Steel Pipe.—There is a fairly satisfactory business in steel pipe, as far as volume is concerned, but so keen is the competition for orders and prices so

low, that the orders usually are not gratifying. Price cutting on line pipe is as severe as it has been at any time recently and the Pure Oil Co., which is in the market for 183 miles of 8-in. pipe for the Humphreys field, is expected to get it at a very low price. While quotations are being cut on line pipe, there recently has been some effort to get prices up on oil well goods, and some jobbers who have been quoting 10 per cent off on mill shipments and 5 per cent off on shipments out of stock, are attempting to restore the old discount of 5 per cent on mill shipments and list on shipments out of stock. On merchant pipe an additional 2½ per cent on top of the regular supplementary discount of one, five and 2½ has been fairly common. There is a little better observance of card discounts on the part of makers of wrought iron pipe than is true of the makers of steel pipe. Discounts are given on page 1306.

Sheets.—Demand is on a tapering scale with almost all makers, and the effort of some mills to keep running has resulted in even larger concessions in price than recently. Some makers have gone as low as 2.75c. base for black sheets and 3.75c. base for galvanized sheets, and apparently not much business has been done at higher than 2.75c. base for black sheets, because the bi-monthly settlement between the independent mills and the Amalgamated Association of Iron, Steel and Tin Workers disclosed an average price for September and October of 2.75c. If there was some business at the advance made early in September to 3c. for black sheets, it is evident there must have been some shipments carrying a price of 2.50c. to have produced an average of 2.75c. The more common belief is that little or no business was booked at 3c. and that all mills affected made shipments largely on order at 2.75c. Prices are given on page 1306.

Tin Plate.—Manufacturers are finding business calling for early shipment exceedingly limited, but report gratifying success in getting orders and specifications for the early part of 1922 delivery, and it is confidently believed that the mills will be more fully engaged during the winter months than before in several years, and also that the container manufacturers will have anticipated their shipments to a point where a congestion of rush orders next summer will be avoided. All makers are quoting $4.75 per base box for production plate for delivery immediately or after Jan. 1. Shading of this price is unlikely because it is well below cost of most makers.

We quote standard production coke tin plate at $4.75 per base box f.o.b. Pittsburgh for carload lots.

Cold-finished Steel Bars and Shafting.—Demand is somewhat better diversified, but still lacks volume. There are signs that some consumers have liquidated their stocks pretty well, but this hardly is applicable to the automotive industry which, as a whole, still is rather heavily stocked and indeed, is providing some competition for manufacturers by selling some of the surplus supplies. One division of the General Motors Co., which is overstocked, has written down the value to the equivalent of 2c., Pittsburgh, and is supplying some of the other divisions of that company at that price. Makers regard the market as 2.15c. to 2.25c. base, Pittsburgh, and are not disposed to shade these prices on the ground that they are unable to buy hot-rolled bars for cold finishing at less than 1.60c. Pittsburgh.

Hoops and Bands.—Makers here find business excessively dull. Few new demands are coming out and specifications against business taken by makers prior to the recent $5 per ton advance, to 2.25c. base, are light.

Hot-Rolled and Cold-Rolled Strips.—Recent improvement in specifications has not been maintained in either kind of material. Business, indeed, again is very quiet, and the common expectation is that it will remain slack until the end of the year. The official quotations are 2.25c. base, Pittsburgh, on hot-rolled strips, and 4c., base on cold-rolled, but only a very small fraction of the business on makers' books carries these prices.

Nuts, Bolts and Rivets.—There is little or no improvement in the demand and makers here still find it necessary to forget quoted discounts and prices to secure even small orders. Prices and discounts are given on page 1306.

Coke and Coal.—The market in furnace coke here is positively the most limited that the trade has experienced in a long time. Most of the larger oven operators are confining production strictly to contract requirements, and this production is ample for present demand. Those operators who put on producing capacity without having orders or consuming connections find there is almost no market for their coke, and have considered themselves fortunate in being able to make sales at $3 per net ton oven. On new production the market is quotable at $3.25. The contract market is indefinite because none of the blast furnace interests in this district yet is figuring on future requirements. The market is quiet in foundry coke, one prominent producer recently having put out 50 ovens in an effort to bring production and requirements closer together. The market is still quotable on standard grade at $4.25 to $4.50 per net ton oven, for standard coke, but extra choice brands occasionally fetch $4.75, but loaded cars are not readily disposed of above $4. The coal market is dull and weak, with non-union steam coal available at $1.50, for mine run grade; by-product at $1.75, while gas coal, being chiefly from union fields, is quoted at $3.40 for mine run and about $2.65 to $2.75 for lump.

Spikes.—The Illinois Central Railroad recently closed for 2000 kegs of standard spikes, and the Erie Railroad for 3000 kegs, the business going to a Pittsburgh maker at $2.25 base, per 100 lb. On large lots, the market is not quotable at above $2.25 base, per 100 lb., but makers are endeavoring to obtain $1 to $2 per ton more for less than carloads. Some weakness also is apparent in small spikes, which have sold as low as $2.40 base, per 100 lb. and are fetching more only in small lots. Prices are given on page 1306.

Old Material.—The market in the open-hearth grades is largely sustained by the purchases of one or two companies and it is admitted that should either or both withdraw from the market, lower prices would instantly ensue. The market lacks breadth and by the same token is lacking in strength. High prices still are being paid the railroads and other producers, but not by the consumers, who have rather fixed ideas as to prices and are disinclined to go above them. The prices being paid by dealers cannot be regarded as the market for the reason that only in rare instances are consumers meeting the dealers' prices. Rerolling rails recently offered by the Pennsylvania Railroad sold as high as $17 delivered, Newark, Ohio, but this price was paid by a dealer and not by the consumer at that point. The recent premium of about $1 per ton over heavy melting steel on rolled steel wheels and railroad knuckles, couplers and springs, lately has not been easy to obtain. A dealer recently paid $27 for iron car axles to complete a short contract. Foundries in this district are less fully employed than recently and are more sparing buyers of old material.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate, as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh	$14.50 to $15.00
No. 1 cast cupola size	17.50 to 18.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	16.00 to 16.50
Compressed sheet steel	12.00 to 12.50
Bundled sheet sides and ends, f.o.b. consumers' mills, Pittsburgh dist.	11.00 to 11.50
Railroad knuckles and couplers	15.00 to 15.50
Railroad coil and leaf springs	15.00 to 15.50
Low phosphorus standard bloom and billet ends	20.00 to 21.00
Low phosphorus plates and other grades	17.50 to 18.50
Railroad malleable	13.50 to 14.00
Iron car axles	26.00 to 27.00
Locomotive axles, steel	24.00 to 25.00
Steel car axles	16.50 to 17.00
Cast iron wheels	16.00 to 16.50
Rolled steel wheels	15.00 to 15.50
Machine shop turnings	10.00 to 10.50
Sheet bar crop ends	14.50 to 15.00
Heavy steel axle turnings	12.50 to 13.00
Short shoveling turnings	11.00 to 11.50
Heavy breakable cast	15.00 to 15.50
Stove plate	13.00 to 13.50
Cast iron borings	10.50 to 11.00
No. 1 railroad wrought	12.00 to 12.50

Chicago

CHICAGO, Nov. 15.

Weakness pervades the iron and steel market. With the exception of wire products, cast-iron pipe and standard section rails, no material is on a stable price basis. Pig iron has been sold at as low as $20 base furnace. Plates, shapes and bars are moving in some instances at concessions varying from $1 to $3 a ton below asking prices. Sheets are weaker and are being offered at $2 under the previously ruling market. Prices on certain track materials show signs of softness. Bolts and nuts have grown no firmer. The entire situation is in a confused and nebulous state and it will perhaps take a week or two for it to clarify. Mills have been forced to add to their already heavy losses because of their desire to retain the gains in operations thus far achieved. With the accumulation of orders, however, they are expected to take a firmer stand in an effort to prevent further additions to the red figures on their ledgers.

The principal source of encouragement not only to the mills and furnaces but to foundries and a large group of manufacturers of equipment and appliances is to be found in the railroad car buying which is under way. Orders for new cars placed within the past week and fresh inquiries promise to put more than 120,000 tons of steel on the books of Western mills. Considerable additional steel will be bought for car repair work, which shows no signs of abatement.

Mill operations have improved, the Illinois Steel Co. being on a 50 per cent basis, while the Inland Steel Co. is averaging over 40 per cent.

Pig Iron.—The initial Iroquois furnace to be blown in is now producing iron and a Mayville stack is scheduled to go in the near future. While buying is still irregular and cautious, it is steadily eating up the reserves on furnace yards with the result that increased production has been found necessary. It cannot yet be said that the demand is other than light, but the situation appears to be headed in the right direction. The release of large orders for cars by the railroads is expected to bring tonnage to melters in this district. One car builder in this vicinity is reported to have bought 2000 tons of foundry within the past week. Notwithstanding the increased consumption in prospect, the market shows signs of weakness. The ruling price for foundry, basic and malleable still appears to be $21 base, furnace, but some concessions up to $1 a ton have been made. The largest orders reported for some time were recently placed by the Allis-Chalmers Mfg. Co., Milwaukee. This company bought 6000 tons of foundry, 2000 tons of charcoal and 500 tons of silvery for first half delivery. The foundry is reported to have been placed at $21 delivered, while the silvery, which was 7 per cent resale, is said to have brought $31 delivered. Another Wisconsin melter bought 150 tons of resale Southern high phosphorus. A local steel melter purchased 200 tons of copper free low phosphorus at $38, delivered. A cast iron car wheel manufacturer is inquiring for 800 tons of foundry for first quarter shipment to two of its Western plants. A Milwaukee melter wants 1700 tons of Southern foundry for first half delivery.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge averaging 70c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b., furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$31.50 to $33.50
Northern coke, No. 1, sil. 2.25 to 2.75	21.50
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	21.00
Northern high phos	21.00
Southern foundry, sil. 1.75 to 2.25	25.67
Malleable, not over 2.25 sil	21.00
Basic	21.00
Low phos., Birmingham	32.00
Low phos., Eastern furnace, sil. 1 to 2 per cent copper free	34.00
Silvery, sil. 8 per cent	34.82

Ferroalloys.—The market is inactive.

We quote 78 to 82 per cent ferromanganese, $66.75, delivered; 50 per cent ferrosilicon, $60, delivered; spiegeleisen, 18 to 22 per cent, $36 to $37, delivered.

Railroad Equipment.—The Atchison, Topeka & Santa Fe has equally divided an order for 2500 refrigerator cars between the American Car & Foundry Co. and the Haskell & Barker Car Co. The Illinois Central has bought 650 refrigerator cars from the General American Car Co., and 350 refrigerator cars from the Haskell & Barker Car Co. Directors of the Chicago, Burlington & Quincy and its subsidiary, the Colorado & Southern have authorized the purchase of $15,000,000 worth of new rolling stock, including 7300 freight cars, 55 heavy freight and passenger locomotives, and 127 all-steel passenger cars. Directors of the Chicago & Northwestern also announce that between $5,000,000 and $10,000,000 will be expended to replenish rolling stock. Inquiries by the Burlington call for 2500 box cars, 3000 general service cars, 500 stock cars, 1300 refrigerator cars, and 127 passenger service cars. The passenger equipment includes 12 dining, five chair, 12 baggage, 22 mail, 19 mail and baggage cars, 54 coaches, two combination coach and chair cars and one combination coach and baggage car. The Illinois Central is expected to close to-morrow on 2000 gondola cars and 500 Hart convertible cars. In addition it has an inquiry out for 500 46-ft. gondola cars and is preparing to ask for tenders on 500 flat cars. The Missouri, Kansas & Texas is expected to place orders next week for 30 coaches and 10 baggage cars and is also in the market for 32 underframes for 30-ton box cars. The Burlington has let repairs on 600 all-steel 50-ton gondola cars, dividing the order equally between the Western Steel Car & Foundry Co. and the General American Car Co. The Chicago & Alton has awarded repairs on 200 gondola cars to the Mount Vernon Car Mfg. Co. The Missouri Pacific is inquiring for repairs on 1000 30-ton box cars and the American Refrigerator Transit Co. wants steel underframe reinforcements for 100 refrigerator cars. The Chicago Great Western is asking for repairs on 100 refrigerator cars and 150 National dump cars, and the Belt Railway of Chicago is inquiring for repairs on 250 to 300 National dump cars. The Erie has let repairs on 100 composite gondola cars with the Standard Tank Car Corporation.

Cast Iron Pipe.—Makers have advanced their differentials $1 a ton. Four-in. water pipe, which formerly was quoted at $3 above the base price of 6 in. and larger, now takes an extra of $4 and the same is true of Class A and gas pipe. Base prices also appear to be firmer, the minimum going quotation being $34, base Birmingham. Although buying is falling off, as is to be expected at this season, it is still of encouraging proportions. Purchases by private gas companies have brought round tonnages to the pipe shops of late, and some good-sized municipal lettings are reported. The tonnage booked by pipe makers thus far this year compares favorably with that taken during the entire previous year. Lettings include:

Parsons, Kan., 2000 tons, to American Cast Iron Pipe Co.

Summit County, Akron, Ohio, 500 tons, to National Cast Iron Pipe Co.

Fairfield, Iowa, 275 tons, to American Cast Iron Pipe Co.

Loup City, Neb., 200 tons, to National Cast Iron Pipe Co.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $47.10 to $48.10; 6-in. and above, $43.10 to $44.10; class A and gas pipe, $4 extra.

Bolts and Nuts.—No improvement in demand is to be noted and discounts still lack stability. For mill prices, see finished iron and steel, f.o.b., Pittsburgh, page 1306.

Jobbers quote structural rivets, 3.43c.; boiler rivets, 3.53c.; machine bolts up to ¾ x 4 in., 60, 10 and 10 per cent off; larger sizes, 60 and 10 off; carriage bolts up to ¾ x 6 in., 60 and 10 off; larger sizes, 55 and 5 off; hot pressed nuts, square and hexagon tapped, $3.75 off; blank nuts, $4.00 off; coach or lag screws, gimlet points, square heads, 65 and 5 per cent off. Quantity extras are unchanged.

Structural Material.—Plain material is weak and in some instances concessions of from $1 to $3 a ton below the minimum quotation named below have been made. The principal source of tonnage is from car builders, as structural lettings have fallen off. The Pittsburgh-Des Moines Steel Co. will fabricate 232 tons for the Lincoln High School, Des Moines, Iowa. The Kansas City Bridge Co., Kansas City, Mo., has the

general contract for repairs to the Wabash Railroad bridge, Attica, Ind., involving 340 tons, but the fabricating work has not been sublet. The Virginia Bridge & Iron Co. is low bidder on 400 tons for the Hunt Building, Tulsa, Okla. Bids have been taken on 1000 tons for a Masonic Temple, San Antonio, Tex. On Nov. 24 figures will be taken on 2050 tons for a building for the National Biscuit Co., Buffalo. Action will be taken on a bascule bridge at Green Bay, Wis., requiring 700 tons, about the first of the year, and bids on the general contract for a bascule bridge at Sheboygan, Wis., will be received Nov. 21 by Klug & Smith, engineers, Milwaukee.

The mill quotation on plain material ranges from 1.75c. to 1.85c., Chicago. Jobbers quote 2.78c. for materials out of warehouse.

Bars.—Demand is light and prices are soft. Owing to the confused state of the market, it is impossible to put one's finger on a ruling price. A few sales, however, have been made at as low as 1.65c., local mill, for mild steel bars, and a $1 per ton less than that is also reported to have been named recently. In view of the increased losses accruing from each additional concession made, a reaction in the direction of greater firmness on the part of the mills is looked for by some observers. The largest reinforcing job in immediate prospect is the Grant Park stadium, Chicago, requiring 3000 tons on which bids will be taken Nov. 25. The Concrete Steel Co. will furnish 200 tons for the Lincoln High School, Des Moines, Iowa, and the Paul J. Kalman Co. will supply 200 tons for the South Park Bank, Chicago. H. H. Hall, contractor, has awarded 200 tons to the Laclede Steel Co. for State highway work in Jefferson and Washington counties, Ill., and still has 600 tons to buy. The B. K. Gibson Co., Chicago, will receive bids early next month on an eight-story reinforced concrete hotel at Grand Rapids, Mich., to cost $1,000,000. Bar iron business is light and prices have dropped to 1.65c., Chicago. Demand for hard steel bars shows no change for the better and the ruling market has declined to 1.65c., Chicago.

Mill prices are: Mild steel bars, 1.65c., Chicago; common bar iron, 1.75c., Chicago; rail carbon, 1.65c., mill or Chicago. Jobbers quote 2.68c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.55c. for rounds and 4.05c. for flats, squares and hexagons. Jobbers quote hard and medium deformed steel bars at 2.10c. base. Hoops and bands, 3.28c.

Wire Products.—This market is relatively the most active in the iron and steel field; yet it is not so flourishing as some weeks ago. A reaction in cotton has had a depressing effect on business in the South and it is conceded that low grain prices impede buying in the Western agricultural communities. On the other hand, railroad purchases appear to be gaining in volume, one Northwestern line having recently placed an order for 1700 kegs of nails. An early advance in prices does not appear to be imminent. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 1306.

We quote warehouse prices f.o.b. Chicago: No. 9 and heavier black annealed wire, $3.48 per 100 lb.; No. 9 and heavier bright basic wire, $3.63 per 100 lb.; common wire nails, $3.63 per 100 lb.; cement coated nails, $3.05 per keg.

Warehouse Prices.—Local warehouses have announced reductions on plates, structural shapes, bars, hoops and bands, rivets, bolts and nuts. Plates and shapes have been marked down from $2.88 to $2.78 per 100 lb., a reduction of $2 a ton. Mild steel bars have been reduced from $2.78 per 100 lb. to $2.68, a cut of $2 a ton. The quotation on hoops and bands has been changed from $3.48 per 100 lb. to $3.28, a reduction of $4 a ton. Cold rolled steel bars and shafting have been reduced $6 a ton, the new quotation on rounds being $3.55 per 100 lb. The revised quotations on rivets, bolts and nuts are shown in the bolt and nut paragraph. In addition to the changes in base prices noted above, the extra for 3/16-in. plates has been reduced from 18½ to 17½c. per 100 lb.

Plates.—Price shading is on the increaes, but with more and more railroad car business making its appearance, it is felt in some quarters that further changes in the market situation will be in the direction of stability. Orders and inquiries for new cars which have developed in the West during the past week will put more than 125,000 tons of steel on mill books. In addition, considerable tonnage will be accounted for by the placing of cars which have been pending for some time, such as those inquired for by the Illinois Central. Car repair work is still being undertaken on a large scale and will also result in large orders for steel.

The ruling mill quotations range from 1.70c. to 1.85c. Chicago. Jobbers quote 2.78c. for plates out of stock.

Sheets.—The market has weakened and concessions of $2 a ton have been rather commonly made on both galvanized and black. It is reported that as low as 3.75c. and 2.75c., base Pittsburgh, respectively have been named on some business.

Mill quotations are 2.90c. to 3c. for No. 28 black, 2.25c. for No. 10 blue annealed and 3.90c. to 4c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight to Chicago of 38c. per 100 lb.

Jobbers quote: Chicago delivery out of stocks, No. 10 blue annealed, 3.38c.; No. 28 black, 4.15c.; No. 28 galvanized, 5.15c.

Rails and Track Supplies.—Further rail specifications in moderate tonnages are being received from day to day and it seems probable that the local mill will continue to produce at the present rate—about half of capacity—throughout the remainder of the year. Releases against contracts for spikes, bolts and angle bars are also more numerous. Standard spikes are weaker and do not appear to be moving at a higher price than 2.25c., Pittsburgh. Three thousands kegs bought by the Illinois Central were placed at slightly less than that figure.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 1.70c. to 1.75c. f.o.b. makers' mills.

Standard railroad spikes, 2.25c., Pittsburgh; track bolts with square nuts, 3.30c., Pittsburgh; tie plates, steel and iron, 2c., f.o.b. mill; angle bars, 2.40c., f.o.b. mill.

Old Material.—Cast iron car wheels have advanced as a result of a fair-sized purchase by a railroad car builder. There has also been moderate buying of open-hearth grades by a local steel mill. With these two exceptions, the market has been quiet and practically devoid of consumptive demand. A few grades have advanced in anticipation of buying by foundries serving car builders and there have been a number of declines, but on the whole market prices show little change. No railroad offerings are reported.

We quote delivery in consumers' yards Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$17.00 to $17.50
Relaying rails	25.00 to 30.00
Car wheels	17.00 to 17.50
Steel rails, rerolling	14.00 to 14.50
Steel rails, less than 3 ft	13.75 to 14.25
Heavy melting steel	12.50 to 13.00
Frogs, switches and guards cut apart	12.50 to 13.00
Shoveling steel	12.00 to 12.50
Low phos. heavy melting steel	15.50 to 16.00
Drop forge flashings	8.00 to 8.50
Hydraulic compressed sheet	8.50 to 9.00
Axle turnings	9.00 to 9.50
Per Net Ton	
Iron angles and splice bars	15.00 to 15.50
Steel angle bars	12.00 to 12.50
Iron arch bars and transoms	15.50 to 16.00
Iron car axles	20.50 to 21.00
Steel car axles	14.50 to 15.00
No. 1 busheling	9.50 to 10.00
No. 2 busheling	6.25 to 6.75
Cut forge	11.00 to 11.50
Pipes and flues	7.50 to 8.00
No. 1 railroad wrought	12.50 to 13.00
No. 2 railroad wrought	11.50 to 12.00
Steel knuckles and couplers	13.00 to 13.50
Coil springs	14.00 to 14.50
No. 1 machinery cast	13.75 to 14.25
No. 1 railroad cast	13.50 to 14.00
Low phos. punchings	12.00 to 12.50
Locomotive tires, smooth	11.00 to 11.50
Machine shop turnings	4.50 to 5.00
Cast borings	6.50 to 7.00
Stove plate	12.50 to 13.00
Grate bars	12.00 to 12.50
Brake shoes	11.75 to 12.25
Railroad malleable	13.50 to 14.00
Agricultural malleable	13.50 to 14.00

Ore Users Invited

The traffic executive committee, Eastern territory, has invited shippers and users of iron ore to attend the hearing at its office, 143 Liberty Street, New York, Thursday, Nov. 17, at 2 p. m., with a view to determining iron ore freight rates after Jan. 1, until which time the 28 per cent reduction recently put into effect remains in force. The situation is explained in full in a letter from Washington, published in this issue.

New York

NEW YORK, Nov. 15.

Pig Iron.—Dullness continues and is generally attributed to the expectation of buyers that freight rates will be lower and that there will be a corresponding reduction in pig iron prices. In some foundries, particularly those connected with the manufacture of printing presses and textile machinery, there is much activity and shipments have shown an increase in some directions. On the other hand, a number of foundries have reduced their melt within the last week or two. Southern iron weakness has been emphasized by the action of one large company which, having sold large tonnages at prices as high as $40, has been unable to effect deliveries on a considerable part of the amount sold, and is selling the iron at $18 Birmingham, charging the difference between that price and the selling price to the customers. Prices on eastern Pennsylvania iron are being well maintained.

We quote delivered in the New York district as follows, having added to furnace prices $2.52 freight from eastern Pennsylvania, $5.46 from Buffalo and $6.16 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$24.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	23.52
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	23.02
Buffalo, sil. 1.75 to 2.25	25.46
No. 2 Virginia, sil. 1.75 to 2.25	29.16

Ferroalloys.—No inquiry for ferromanganese is noted and the market is nominal at prevailing quotations. It is reported that the leading steel producer of the country recently sold 1200 tons. There are inquiries for a few carload lots of spiegeleisen but otherwise the market is devoid of interest. One seller of manganese ore has a cargo of about 1000 tons on which he has been unable to obtain an offer. The 50 per cent ferrosilicon market is moderately active at prevailing quotations, and it is understood that the seller which was offering material at concessions is no longer active. Quotations are as follows:

Ferroalloys

Ferromanganese, domestic, delivered, per ton	$60.00 to $61.00
Ferromanganese, British, seaboard, per ton	$58.35
Spiegeleisen, 20 per cent, furnace, per ton	$25.00 to $26.00
Ferrosilicon, 50 per cent, delivered, per ton	$58.00 to $60.00
Ferrotungsten, per lb. of contained metal	48c. to 58c.
Ferrochromium, 6 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	10c. to 14c.
Ferrovanadium, per lb. of contained vanadium	$4.50

Ores

Manganese ore, foreign, per unit, seaboard	20c.
Tungsten ore, per unit, in 60 per cent concentrates	$2.50 up
Chrome ore, 40 to 45 per cent Cr_2O_3, crude, per net ton, Atlantic seaboard	$20.00 to $25.00
Chrome ore, 45 to 50 per cent Cr_2O_3, crude, per net ton, Atlantic seaboard	$30.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	55c. to 60c.

Warehouse Business.—Transactions in this district continue in about the same groove. Some warehouses believe that November will show a slight increase over the previous month, but in general business shows no change. The leading warehouse interest, the foremost independent and most of the other warehouses have revised their price schedules in accordance with the prices now being quoted by mills. The quotations are based on a 38c. per 100 lb. freight rate from Pittsburgh and a spread of 65c. per 100 lb. from the mill price. Mild steel bars are now quoted at 2.68c. per lb.; structural material, 2.78c. per lb. and steel plates at 2.78c. per lb., representing a reduction of 10c. per 100 lb. Hoops have been reduced from 3.88c. to 3.53c. per lb. and bands from 3.43c. to 3.28c. per lb. All these prices are f.o.b. warehouse or delivered in the Metropolitan district. Charcoal tin plate is down 50c. per box and primes and wasters, 75c. per box. Dealers in brass and copper report no change, business continuing good. In the wrought iron and steel pipe market, price schedules are unchanged, although there has been and still is some reselling at low prices. Excepting on very desirable orders, however, there is little tendency to shade. We quote prices on page 1318.

High Speed Steel.—The situation is unchanged, producers generally quoting 90c. per lb. for 18 per cent tungsten high speed steel, as orders now being placed are so small that buyers seldom ask for any quotation.

Finished Iron and Steel.—Railroad buying of cars now looms as one of the promising new features of the market. Recently the railroads have been contracting mostly for car repairs, but now the demand appears to be stronger for new cars. The Chicago, Burlington & Quincy heads the list with an inquiry for 7500 freight cars, 127 all-steel passenger cars and 55 locomotives. The Seaboard Air Line will shortly be in the market for 400 cars of miscellaneous types, the formal inquiry not yet having been issued. The Delaware, Lackawanna & Western may close this week for 500 box cars, the inquiry having been issued several weeks ago. The Santa Fe has placed 2500 refrigerator cars, 1250 each to the American Car & Foundry Co. and the Haskell & Barker Car Co. The Illinois Central has also bought 1000 "freezers" of which 650 were awarded to the Haskell & Barker Car Co. and 250 to the General American Car Co. The Alabama, Tennessee & Northern, which recently inquired for 250 gondolas and 50 flat cars, has placed part or all of this number with the Mount Vernon Car Mfg. Co. The Denver, Rio Grande & Western Pacific has ordered 700 70-ton steel general service cars from the Pressed Steel Car Co., with an option on 300 additional. Bids were opened last week by the Board of Water Supply, New York, for the water pipe line from the Catskill aqueduct, which will require about 20,000 tons of plates. The low bidders were the Frederick Snare Corporation, 8 West Fortieth Street, New York; Thomas Crimmins Construction Co., 126 East Fifty-ninth Street, New York, and Rice & Ganey, 2786 Bainbridge Avenue, New York. The work will probably be awarded to all three, with the steel tonnage divided as follows in the order in which the companies are named: 10,000, 8000 and 2000 tons. A part of the fabrication of the pipe will quite likely be done in the plant of the Merchant Shipbuilding Corporation, Chester, Pa. It is reported that price protection on the plates was given by more than one mill at 1.50c., Pittsburgh. The Public Service Commission of New York opened bids last week on the extension of the Queensboro subway to Eighth Avenue. The Powers-Kennedy Contracting Corporation, 149 Broadway, New York, was low bidder. This work involves 3200 tons of steel. The Saks' department store to be built in Fifth Avenue at Fiftieth Street, 5200 tons, which was awarded two weeks ago to Post & McCord, has been taken from that firm and awarded to the Hay Foundry & Iron Works. Other awards are as follows: 2100 tons for a group of bridges for the Philadelphia & Reading Railroad, to Bethelhem Steel Bridge Corporation; 450 tons for a clubhouse in West Sixty-fourth Street, New York, to Harris Structual Steel Co.; 1200 tons for an apartment house at Seventh Avenue and Fifty-seventh Street, New York, to Levering & Garrigues Co.; 2300 tons for a loft building in New York to Patterson Bridge Co.; 2400 tons for a loft building for George Bauman, New York, to Hinkle Iron Works; 500 tons for an office and storage building in Brooklyn for the Boyertown Burial Casket Co., Boyertown, Pa., to A. E. Norton. New work on which bids are being made include the following: nine bridges for the Lehigh Valley Railroad, 800 tons; Masonic Temple, Washington, D. C., 300 tons; loft building in West Thirty-fourth Street, New York, 400 tons; South Street bridge, Philadelphia, 1500 tons (bids close about Dec. 15). The price situation on steel products is about as has been reported in recent weeks. Attractive tonnages bring out the lowest figures, which are usually about 1.50c. on plates, shapes and bars. Relatively small lots of these products usually command 1.60c., Pittsburgh. There is some weakness in sheets and variation in prices. The expected advance in wire products has not been put into effect and doubt is expressed as to whether an advance will be made.

We quote for mill shipments, New York, as follows: Soft steel bars, 1.80c. to 1.88c.; plates, 1.88c. to 2.03c.; structural shapes, 1.88c. to 2.03c.; bar iron, 1.98c. to 2.03c. On export shipments the freight rate is now 28.5c. per 100 lb., instead of 38c., the domestic rate.

Cast-Iron Pipe.—Operations continue at from 70 to 80 per cent and the cast-iron pipe industry is probably the busiest of any iron or steel industry, with the exception of the stove and radiator manufacturers. The most attractive pending business is the inquiry for

6700 tons of 36-in. pipe by Syracuse, N. Y., bids for which will be opened Dec. 6. A local contractor secured the contract for furnishing and laying 940 tons of 8, 12 and 20-in. pipe for the water department of New York. The R. D. Wood Co., Philadelphia, was low bidder on 1000 tons of 12-in. pipe for Yonkers, N. Y. The Glamorgan Pipe & Foundry Co., Lynchburg, Va., was last week awarded the contract for pipe for Washington, D. C. There is considerable inquiry for export, particularly for South America, India, Japan and China, but the exchange situation prevents many sales. We quote per net ton, f.o.b. New York, carload lots, as follows: 6-in. and larger, $47.30; 4-in. and 5-in., $52.30; 3-in., $62.30, with $4 additional for Class A and gas pipe.

Old Material.—The inquiry of the Cambria Steel Co. for 10,000 tons of heavy melting steel will not have much effect on this market because the company will pay only $15, delivered, the freight being too high to Johnstown for New Yorkers to profit. It is felt that this material will be supplied largely from territory west of Harrisburg, the steel in the Eastern territory more naturally going to the Bethlehem Steel Co. Borings and turnings have advanced within the week. There is a fair demand for stove plate. Local brokers are not expecting much improvement before spring.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$8.00 to $8.50
Steel rails, short lengths, or equivalent	9.50 to 10.00
Rerolling rails	12.00 to 12.50
Relaying rails, nominal	30.00 to 35.00
Steel car axles	12.00 to 12.50
Iron car axles	21.00 to 21.50
No. 1 railroad wrought	12.00 to 13.00
Wrought iron track	9.50 to 10.00
Forge fire	6.00 to 6.50
No. 1 yard wrought, long	10.50 to 11.00
Light iron	4.50 to 5.00
Cast borings (clean)	6.50 to 7.00
Machine-shop turnings	5.00 to 5.50
Mixed borings and turnings	4.50 to 5.00
Iron and steel pipe (1 in. diam. not under 2 ft. long)	8.75 to 9.25
Stove plate	11.00 to 11.50
Locomotive grate bars	10.50 to 11.00
Malleable cast (railroad)	9.00 to 9.50
Car wheels	12.50 to 13.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$17.00 to $18.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	16.00 to 17.00
No. 1 heavy cast, not cupola size	15.50 to 16.00
No. 2 cast (radiators, cast boilers, etc.)	10.00 to 10.50

Philadelphia

PHILADELPHIA, Nov. 15.

The iron and steel markets have turned extremely quiet in the past week. Inquiries and orders are coming in in much less volume than in preceding weeks. Prices, too, are weak. Business prospects for the immediate future seem to be somewhat clouded, but the impression now prevails that comparatively little activity may be expected until after the New Year. Buyers apparently are holding off in the expectation that prospective freight rate reductions will affect their purchases. Moreover, there seems to be a disposition in some quarters to await whatever constructive economic results may be obtained from the limitation of armament conference now being held in Washington. There have been no developments of outstanding importance within the week.

Pig Iron.—With very little current business to engage attention, the pig iron trade is considering the probable demand for iron for first quarter. As yet there has been relatively little inquiry. Buyers seem to believe that prices will not go higher and that therefore nothing is to be lost by waiting, and, on the other hand, blast furnace operators are in no hurry to sell because of the uncertainty as to the course of costs and selling prices. While some in the trade express the belief that foundry iron prices for first quarter will be slightly higher than those now quoted, it may be said that there is a difference of opinion even among pig iron sellers on this point, with several furnace operators anxious to put their stacks in blast at the first favorable opportunity and with steel companies still offering their surplus iron freely, the opportunity for getting higher prices for iron seems somewhat remote. Considerable iron ore remains to be liquidated and some furnace operators would be willing to take their loss on this ore now if they could obtain sufficient orders to operate their furnaces. Barring some unexpected contingency, it looks, therefore, as if the supply of pig iron for this district would be more than ample to satisfy any expected demand in the near future. A substantial improvement in steel plant operations and consumption of iron would help the merchant pig iron trade immeasurably. A sanitary company is inquiring for 1300 tons of No. 2X iron for first quarter. The minimum price quoted is said to have been about $22.80, with other bids ranging from $1 to $3 a ton higher. Prices in this district for prompt foundry iron are holding firm, considering the low demand and the weakness which has developed in Birmingham and Buffalo markets.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 84 cents to $1.54 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	21.90 to $22.54
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.84 to 23.54
Virginia No. 2 plain, 1.75 to 2.25 sil.	27.74 to 28.74
Virginia No. 2X, 2.25 to 2.75 sil.	28.24 to 29.74
Basic deliv. eastern Pa.	20.50 to 21.00
Gray forge	22.50 to 23.00
Malleable	24.00 to 25.00
Standard low phos. (f.o.b. furnace)	36.50
Copper bearing low phos. (f.o.b. furnace)	35.00

Ferroalloys.—Domestic producers of ferromanganese have not changed their price from $58.35, seaboard, despite the selling of ferromanganese by the Steel Corporation at $60, Pittsburgh. Spiegeleisen is nominally held at $25 to $27, furnace.

Billets.—There is very little inquiry. Open-hearth rerolling billets are obtainable at about $29, Pittsburgh, and forging billets $5 higher.

Plates.—Orders for plates have been placed at 1.50c., Pittsburgh, and even this price appears to have been slightly shaded by mills possessing a freight rate advantage. The demand is exceedingly light.

Structural Shapes.—Fabricators are figuring closely on structural steel work and on attractive projects have no difficulty in obtaining protection at 1.50c., Pittsburgh. It is intimated that this price has been shaded in recent transactions. A hotel for Los Angeles, Cal., requiring 6000 tons, is being figured on.

Bars.—The steel bar market is no weaker but low prices, usually about 1.50c., Pittsburgh, continue to be made on desirable business. Small lots of merchant steel bars are being sold at 1.55c. and 1.60c. Bar iron is nominally quoted at 1.60c., but on an attractive specification it would not be difficult to shade this price at least $1 a ton.

Sheets.—Various prices are being made on sheets, the general tendency being to shade quotations on attractive business. Blue annealed is being sold from 2.25c. to 2.50c.; black at 2.85c. to 3c. and galvanized from 3.90c. to 4c. base, Pittsburgh. Demand is light and not at all in keeping with the spurt which was in evidence a few weeks ago.

Bolts.—A shipbuilding company has inquired for 700,000 bolts, all of one size, for a large job on which it is figuring.

Warehouse Business.—Local warehouses have reduced prices on a number of items from $2 to $3 a ton.

Soft steel bars and small shapes, 2.65c.; iron bars (except bands), 2.50c.; round edge iron, 2.80c.; round edge steel, iron finish, 1½ x ½ in., 2.95c.; round edge steel planished, 3.70c.; tank steel plates, ¼-in. and heavier, 2.75c.; tank steel plates, 3/16-in., 2.925c.; blue annealed steel sheets, No. 10 gage, 3.50c.; light black sheets, No. 28 gage, 4c.; galvanized sheets, No. 28 gage, 5c.; square twisted and deformed steel bars, 2.65c.; structural shapes, 2.60c.; diamond pattern plates, ¼-in., 4.60c.; 3/16-in., 4.785c.; ⅛-in., 4.90c.; spring steel, 4.10c.; round cold-rolled steel, 3.75c.; squares and hexagons, cold-rolled steel, 4.25c.; steel hoops, No. 13 gage and lighter, 3.50c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.25c.; iron bands, 3.90c.; rails, 2.75c.; tool steel, 8c.; Norway iron, 5c.; toe steel, 4.50c.

Coke.—Prices for furnace and foundry coke have weakened. For furnace coke $3.25 is the nominal quotation, but this could be shaded at least 10c. and possibly as much as 25c. a ton. Foundry coke is available at $4.25 or slightly less.

Old Material.—Slight weakness has developed in some grades of scrap, notably railroad wrought, car wheels and pipe. Cast borings are higher. In common with the quiet which prevails in other branches of the market, the scrap trade is in the midst of another lull in buying and some material which had to be shipped has been sold at slight concessions. Railroad wrought is obtainable at $16, car wheels at $17 and pipe at $13.

No. 1 heavy melting steel	$12.00 to $13.00
Scrap rail	12.00 to 13.00
Steel rails, rerolling	16.50 to 17.00
No. 1 low phos., heavy 0.04 and under	17.00 to 18.00
Car wheels	17.00 to 18.00
No. 1 railroad wrought	16.00 to 16.50
No. 1 yard wrought	13.50 to 14.00
No. 1 forge fire	10.50 to 11.00
Bundled sheets (for steel works)	10.50 to 11.00
No. 1 busheling	12.00 to 13.00
No. 2 busheling	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use)	9.00 to 9.50
Mixed borings and turnings (for blast furnace use)	9.00 to 9.50
Machine-shop turnings (for rolling mill and steel works use)	10.00 to 10.50
Heavy axle turnings (or equivalent)	10.00 to 10.50
Cast borings (for rolling mills)	11.50 to 12.00
Cast borings (for chemical plants)	12.50 to 13.00
No. 1 cast	17.50 to 18.00
Railroad grate bars	14.50 to 15.00
Stove plate (for steel plant use)	14.50 to 15.00
Railroad malleable	14.50 to 15.00
Wrought iron and soft steel pipes and tubes (new specifications)	13.00 to 13.50
Iron car axles	No market
Steel car axles	No market

Cleveland

CLEVELAND, Nov. 14.

Iron Ore.—The ore shipping season is over with the exception of three or four cargoes which will be brought down early this week. With the lightest movement of Lake Superior ore since 1904, or in 17 years, ore firms are beginning to look to the prospects for business next year and estimates of the 1922 shipments range from 40,000,000 to 50,000,000 tons. Operations in several of the mines of the Menominee range are being resumed. One interest, in order to furnish work for its miners, has opened a mine in that district at a further reduction in the wage scale, and another interest will start up two mining properties in the same district with a similar cut in wages. In both cases, the operators see no need of opening the mines, but they wish to furnish work for the men and feel that in view of the low wage scale they can stock ore without knowing what reductions will be made in ore prices. Owing to light shipments this year, the lake shipping season is closing with slightly less ore on Lake Erie docks than last year. The balance on docks Nov. 1 was 9,672,077 gross tons as compared with 10,212,975 tons on the same date a year ago. Ore receipts at Lake Erie docks during October were 2,052,113 tons as compared with 7,175,718 tons the same month last year. Receipts at Lake Erie ports for the season until Nov. 1 were 15,130,167 tons as compared with 39,134,919 tons during the same period last year. Shipments from Lake Erie ports during October were 1,621,635 tons as compared with 5,054,617 tons during October, 1920. Shipments from these ports for the season up to Nov. 1 were 11,191,362 tons as compared with 28,277,387 tons to Nov. 1 of last year.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $6.45; Old range non-Bessemer, 51½ per cent iron, $5.70; Mesabi Bessemer, 55 per cent iron, $6.20; Mesabi non-Bessemer, 51½ per cent iron, $5.55.

Pig Iron.—The market is very dull and there are increasing signs of weakness. On an inquiry for 500 tons of foundry iron from an Ohio jobbing foundry a Lake furnace quoted $20, Valley, but did not get the business. Had this furnace taken the order on that basis it would have meant a price considerably under $20 at furnace, owing to the freight differential against this furnace as compared with the Valley. While one Lake furnace is quoting foundry grades in some cases on a $20 Valley basis, merchant furnaces in the Valley district appear generally to be holding to $21 and a sale of a 500-ton lot was made during the week at that price by a Cleveland interest to a Pittsburgh district consumer. With the exception of one producer, Lake furnaces are holding to a minimum of $20 at furnace for foundry iron. One maker during the week sold 1400 tons and another 700 tons, all in small lots. Little inquiry is pending. Local prices are unchanged at $20 to $20.50 for foundry iron. In the opinion of the producer, the slump in buying is due to the expectation of lower freight rates, the buyers feeling that price reductions would follow a freight rate reduction. Shipments continue light, being in considerably smaller volume than during October.

Quotations below are f.o.b. local furnace for northern foundry iron, not including a 56c. switching charge. Other quotations are delivered Cleveland, being based on a $1.96 freight rate from Valley points, a $3.36 rate from Jackson and a $6.67 rate from Birmingham:

Basic	$20.96
Northern No. 2 fdy., sil. 1.75 to 2.25	20.00 to 21.00
Southern fdy., sil. 2.25 to 2.75	25.17
Ohio silvery, sil. 8 per cent	32.86
Standard low phos., Valley furnace	34.00 to 35.00

Alloy Steel.—Prices on alloy steel have stiffened from ½c. to ¾c. per lb. over the prices that have been prevailing recently, and the market is somewhat more active, some orders being taken at the advance. Two or three orders placed by automobile and accessory makers aggregate 200 tons.

Bolts, Nuts and Rivets.—Demand for bolts and nuts has fallen off as compared with last month, but some car lot orders are still coming out. Price irregularities continue. The demand for rivets has improved slightly. The two inquiries from the East, each for 1000 tons, noted last week, are still pending. One of these is for pipe work.

Semi-Finished Steel.—Sheet bars are now commonly quoted at $30 and there is an unconfirmed report of a sale at $29. Slabs are quoted at $29.

Finished Iron and Steel.—The market shows little life. No orders of sufficient size came out during the week to test prices. While quotations as low as 1.50c. are appearing on steel bars, plates and structural material, much of the business that is going is being placed at 1.60c. for steel bars and shapes. A local bolt and nut maker placed 350 tons of bolt rounds during the week at 1.60c. Plates are weaker than bars and shapes, but plate sales are being made at 1.55c. to 1.60c. and a few small lot orders are being booked at 1.75c. In some cases, mills that have been adhering to the higher prices seem more inclined to make concessions. One local plate mill that has been on a 1.75c. basis is now quoting 1.65c. In the building field there is little activity. Cleveland will start the construction of a new $4,000,000 public library early in the year, the voters having authorized an additional bond issue. As this will be a reinforced concrete building, it will require a round tonnage of steel bars but little structural material. Detroit has taken bids for the Fort Street bascule bridge requiring 1200 tons of structural material, and another municipal bridge in Detroit requiring 330 tons is reported to have been placed with the McClintic-Marshall Co. The Mount Vernon Bridge Co. has taken a bridge in West Palm Beach, Fla., requiring 121 tons. The demand from the automobile manufacturers is limited and it is expected that orders to be placed later in the month for December requirements will be much lighter than purchases during recent months. Railroads that buy in this territory have not yet come in the market for rails for next year.

Jobbers quote steel bars, 2.54c.; plates and structural shapes, 2.64c.; No. 9 galvanized wire, 3.50c.; No. 9 annealed wire, 3.25c.; No. 28 black sheets, 3.75c.; No. 28 galvanized sheets, 4.75c.; No. 10 blue annealed sheets, 3.10c.; hoops and bands, 3.14c.; cold-rolled rounds, 3.85c.; flats, squares and hexagons, 4.35c.

Sheets.—With new demand very light, weakness in the sheet market is more pronounced. Black sheets are being quoted at 2.75c. and galvanized at 3.75c., or $5 a ton lower than the regular price, although 2.90c. and 3.90c. seem to be the more common quotations for small lots. Blue annealed sheets have slipped $3 a ton to 2.10c. for the heavy gages. Evidence has come out that some mills before they advanced prices protected customers for the remainder of the year with the 2.75c. and 3.75c. prices.

Warehouse Business.—Local jobbers have reduced prices $2 a ton on steel bars, plates and structural ma-

terial and on hoops and bands, basing present prices on mill prices of 1.65c. on bars, 1.75c. on plates and structural material, and 2.25c. on hoops and bands, with a 65c. differential. Other prices are unchanged. Warehouse orders for sheets are fair, but other lines are quiet.

Old Material.—The market shows a weakening tendency as a result of a falling off in the demand. A Canton consumer during the week purchased a moderate tonnage of shoveling turnings, but with this exception, no buying is reported by consumers. Dealers' sales for some time have been largely in the Youngstown district, but dealers have covered against orders for Youngstown mills, so that there is no new demand from that source. Shoveling turnings have sold at $10.80 for Canton delivery but with the softening of the market, dealers are now offering only $10.25 to $10.50 for that grade for Canton shipment.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$12.00 to $12.50
Steel rails, under 3 ft	13.00 to 13.50
Steel rails, rerolling	13.50 to 14.00
Iron rails	11.00 to 12.00
Iron car axles	18.00 to 19.00
Low phosphorus melting scrap	12.50 to 13.00
Cast borings	8.00 to 8.25
Machine shop borings	6.75 to 7.25
Mixed borings and short turnings	7.75 to 8.25
Compressed steel	9.50 to 10.00
Railroad wrought	12.00 to 12.50
Railroad malleable	12.00 to 12.75
Light bundled sheet stampings	7.00 to 7.50
Steel axle turnings	10.00 to 10.50
No. 1 cast	15.00 to 16.00
No. 1 busheling	8.25 to 8.75
Drop forge flashings, over 10 in	8.00 to 8.50
Drop forge flashings, under 10 in	8.00 to 8.50
Railroad grate bars	12.75 to 13.00
Stove plate	13.00 to 13.25
Pipes and flues	8.50 to 9.00

Boston

BOSTON, Nov. 15.

Pig Iron.—Following a period of inactivity, the local market for Buffalo and eastern Pennsylvania iron is weaker. A lot of 400 tons of Buffalo iron, silicon 2.75 to 3.25, for 1921 delivery, sold this week to a local melter at $19.50 furnace, or $25.21 delivered. In this instance the furnace disregarded differentials, and still quotes a flat price on any silicon. Resale Buffalo, purchased by brokers during the recent dip in prices, is offered in any amounts at $19.50 furnace base. Differentials vary from 5c. to 50c., according to trading conditions. One Buffalo furnace, well sold up for the rest of 1921, holds at $20 base. An eastern Pennsylvania company heretofore quoting at $23 base, having increased its furnace output, has dropped to $20, and has sold a small tonnage to a Connecticut foundry having a $3.50 freight rate at $20.50 furnace for No. 2X, or $24 delivered. Another eastern Pennsylvania furnace, recently blown in and desiring a backlog, this week sold iron analyzing silicon 2.25 to 2.75 at $20, and silicon 2.75 to 3.25 at $21 furnace, or $24.06 and $25.06 delivered, respectively. On the No. 2X this represents a drop of 50c. a ton in the general market. Total sales of Buffalo and eastern Pennsylvania in this district approximate 1500 tons this week, all of it for 1921 delivery. A few New England foundries signify intentions of buying iron in December. Buying of Alabama and Virginia irons is not sufficiently active to create competition among sellers.

We quote delivered at common New England points as follows, having added to furnace prices $4.06 freight from eastern Pennsylvania, $5.46 from Buffalo, $6.58 from Virginia and $10.66 from Alabama:

East. Penn., silicon 2.25 to 2.75	$24.56 to $25.06
East. Penn., silicon 1.75 to 2.25	24.06 to 24.56
Buffalo, silicon 2.25 to 2.75	24.71 to 25.96
Buffalo, silicon 1.75 to 2.25	24.71 to 25.46
Virginia, silicon 2.23 to 2.75	31.08 to 31.58
Virginia, silicon 1.75 to 2.25	30.58 to 31.08
Alabama, silicon 2.25 to 2.75	30.16
Alabama, silicon 1.75 to 2.25	29.66

Finished Steel.—The First National Bank, Boston, has awarded 1550 tons structural shapes to the Consolidated Steel Corporation, New York, for a Buenos Aires branch bank. The Bethlehem Steel Corporation will do the fabricating. The McClintic-Marshall Co. is awarded 270 tons of steel for a Providence, R. I., high school. The placing of the Neponsit River bridge steel has been put over until another week. Steel mill representatives report little done the past week in bars, plates and other products. The Boston Elevated Railway Co. has purchased two 5-ton Holt tractors.

Jobbers now quote: Soft steel bars, $2.81½ per 100 lb. base; flats, $3.31½; concrete bars, $2.15 to $2.81½; tire steel, $4 to $4.40; spring steel, open hearth, $4.50; crucible, $11.50; steel bands, $3.73 to $3.78; steel hoops, $3.46½; toe calk steel, $5; cold rolled steel, $3.75 to $4.25; structural steel, $2.91½; plates, $2.91½ to $3.10; No. 10 blue annealed sheets, $3.73; No. 28 black sheets, $4.50; No. 28 galvanized sheets, $5.50; refined iron, $2.81½; best refined, $4.25; Wayne iron, $5.50; Norway iron, $5.50 base.

Cast Iron Pipe.—The city of Fall River, Mass., unexpectedly has come into the open market for approximately 220 tons 6, 8, 10 and 12-in. cast iron pipe, 1921 delivery. Bids will be opened this week. Otherwise little, if any, business has developed since last reports. Pipe makers are well sold up on small sizes for the remainder of the year and not anxious to quote on deliveries inside five weeks. The situation as regard large pipe is not so tight. We quote per net ton in carload lots f.o.b. Boston and district on 1921 delivery, as follows: 3-in., $66.70; 4-in., $56.70; 6-in., $50.70; 10-in., and larger, $49.70, with a $4 differential on class A and gas pipe.

Coke.—The general foundry coke market shows little change. The two New England producers are still quoting November fuel on a basis of $10.66 delivered where the local freight does not exceed $3.40, while Connellsville is quoted at $4.25 to $4.50 ovens for spot and $4.75 for contract. While the demand for and movement of New England made foundry coke is more active, which is seasonable, there is no snap to the market. The New England Coal & Coke Co. has lighted another battery of 50 ovens, making seven out of its eight batteries in operation, or 350 ovens. This action is based on the growing demand for domestic and industrial coke. In fact, the demand for such cokes is carrying along the foundry coke end of the plant. A few hundred tons of 1922 foundry coke have been booked by one New England maker at prices ruling at date of shipment.

Old Material.—No new buyers of old material developed since last reports, consequently there has not been enough competition among dealers for business to influence prices. Some steel is being moved out of New England to Pittsburgh and Johnstown, but the eastern Pennsylvania mills are taking little, if any. A good demand continues for borings at previously quoted prices, but that for turnings is tapering off and the market is less firm, although not lower. The market for machinery cast is not particularly strong, the absence of buying having begun to make itself felt in spots.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$19.00 to $20.00
No. 2 machinery cast	17.00 to 18.00
Stove plate	15.50 to 16.50
Railroad malleable	13.50 to 14.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$7.50 to $8.00
No. 1 railroad wrought	11.50 to 12.50
No. 1 yard wrought	9.50 to 10.50
Wrought pipe (1-in. in diameter, over 2 ft. long)	8.00 to 8.25
Machine shop turnings	4.00 to 4.50
Cast iron borings, rolling mill	5.00 to 5.50
Cast iron borings, chemical	5.50 to 6.00
Blast furnace borings and turnings	3.50 to 4.00
Forged scrap and bundled skeleton	5.00 to 5.50
Street car axles and shafting	12.00 to 12.50
Car wheels	11.00 to 12.00
Rerolling rails	11.50 to 12.00

Iron and Steel Jobbers Select Washington

The executive committee of the American Iron, Steel and Heavy Hardware Association held its semi-annual meeting in New York Nov. 14 and 15, with Andrew Wheeler, Philadelphia, presiding. It was decided to hold the 1922 convention of the association in Washington in the early part of May. At a luncheon given on Tuesday, Nov. 15, by the executive committee at the Harvard Club, about 60 members of the trade were in attendance including iron and steel jobbers in the metropolitan district and a number of friends of the association.

St. Louis

ST. LOUIS, Nov. 15.

Pig Iron.—The market for Southern pig iron has been established at lower levels through the activity of one of the largest independent producers in the Birmingham district. This concern has made quotations of $18 at the furnace, and has let it be known that it would accept even lower, the action being taken, the trade has been given to understand, through a desire to dispose of such iron as had been sold by it under high-price contracts and then to charge the difference between the price obtained and the price named in the contract to the original purchasers. The Birmingham company is said to have gone so far as to solicit offers for this iron claimed to have been sold under contracts. A quotation of $17.50 made by a St. Louis broker for 650 tons of Southern foundry iron bought by the Southern Pacific failed to get the business because it was too low. Very little Southern iron is being bought here because freight rates still favor the Northern product. Northern pig iron is still being sold at $21, Chicago brokers holding resale iron at that price, and one independent producer there is quoting $22. The last week was exceedingly dull as far as inquiries and sales were concerned.

We quote delivered consumers' yards St. Louis as follows, having added to furnace prices $2.88 freight and war tax from Chicago and $5.91 from Birmingham:

Northern foundry, sil. 1.75 to 2.25	$23.88
Northern malleable, sil. 1.75 to 2.25	23.88
Basic	23.88
Southern foundry, sil. 1.75 to 2.25	23.91

Finished Iron and Steel.—Last week was one of great activity among the railroads. In addition to getting out a number of inquiries of large and small proportions, the purchasing departments are busily at work preparing requisitions for further requirements. The trade is looking to the railroads for considerable business. The Missouri, Kansas & Texas has revived an inquiry issued a year ago and withdrawn for 32 steel underframes for 36-ft. box cars of 60-ton capacity, and this road also wants 300 tons of plates, shapes and bars, which other railroads centering here are also making inquiries for in smaller quantities. The Missouri Pacific has an inquiry out for 100 car wheels, and the St. Louis & San Francisco Railroad wants 324 wheels and 72 tons of 10-in. channels in 41-ft. lengths. The Manufacturers' Railway (St. Louis) wants 73 tons of plates, and the Fort Worth Belt Railway is in the market for 140 tons of 85-lb. rails. Now that the price of oil has increased, there has come renewed activity in the oil fields. The Magnolia Petroleum Co. is in the market for tanks for the Mexia (Tex.) field. The Riter-Conley Co., Pittsburgh, has obtained orders from various Houston (Tex.) industries for 30 tanks. The State Highway Commission of Oklahoma at Muskogee wants 2200 tons of reinforcing bars for four bridges, and bids will be opened next week in Little Rock, Ark., for two concrete bridges, involving 1500 tons of bars. The building situation here is in process of clarification, the builders and the unions having been brought together into conference. Various matters have been referred to committees, and another meeting is to be held today. Labor seems willing to agree to a reduction in wages, possibly 20 per cent, if they can be assured that a building program said to amount to more than $20,000,000 will proceed.

For stock out of warehouse we quote: Soft steel bars, 2.87½c. per lb.; iron bars, 2.87½c.; structural shapes, 2.97½c.; tank plates, 2.97½c.; No. 10 blue annealed sheets, 3.47½c.; No. 28 black sheets, cold rolled, one pass, 4.10c.; cold drawn rounds, shafting and screw stock, 4.20c.; structural rivets, $3.77½ per 100 lb.; boiler rivets, $3.87½; tank rivets, 7/16 in. and smaller, 60-10 per cent off list; machine bolts, large, 55 per cent; small, 60 per cent; carriage bolts, large, 50-5 per cent; small, 55 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, $3.25; and tapped, $3.00 off list.

Coke.—The demand for coke is rather light. There was very little done the last week even in carload orders. The weather the latter part of the week was cold enough to stimulate some buying of domestic coke.

Old Material.—The market for old material continues dull, but prices are firm and unchanged. A limited demand developed during the week from one large consumer for special heavy melting steel, one sale of a small tonnage to this consumer being reported at $14.50 per gross ton, but aside from this there has been no activity from the mills. Rolling mill grades are especially quiet, and wrought and busheling scrap have been offered at slightly lower than listed prices without bringing any buying orders. Current railroad offerings include: Louisville & Nashville, 12,000 tons; Northern Pacific, 2600 tons; St. Louis & San Francisco, 1400 tons and Wabash 200 tons.

We quote dealers' prices, f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Old iron rails	$16.00 to $16.50
Steel rails, rerolling	13.00 to 13.50
Steel rails, less than 3 ft.	13.00 to 13.50
Relaying rails, standard section	30.00 to 35.00
Cast iron car wheels	15.00 to 15.50
No. 1 heavy railroad melting steel	11.50 to 12.00
No. 1 heavy shoveling steel	11.00 to 11.50
Ordinary shoveling steel	10.50 to 11.00
Frogs, switches and guards, cut apart	11.50 to 12.00
Ordinary bundle sheet	5.00 to 5.50
Per Net Ton	
Heavy axles and tire turnings	7.00 to 7.50
Iron angle bars	13.00 to 13.50
Steel angle bars	10.50 to 11.00
Iron car axles	21.00 to 21.50
Steel car axles	14.50 to 15.00
Wrought iron arch bars and transoms	15.00 to 15.50
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	10.00 to 10.50
Steel couplers and knuckles	12.00 to 12.50
Locomotive tire, 42-in. and over, smooth inside	10.00 to 10.50
No. 1 dealers' forge	9.50 to 10.00
Cast iron borings	7.00 to 7.50
No. 1 busheling	10.50 to 11.00
No. 1 railroad cast	14.50 to 15.00
Stove plate and light cast	12.50 to 13.00
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.50 to 10.00
Pipes and flues	8.00 to 8.50
Heavy railroad sheet and tank	7.00 to 7.50
Light railroad sheet	5.00 to 5.50
Railroad grate bars	10.00 to 10.50
Machine shop turnings	6.00 to 6.50
Country mixed iron	7.50 to 8.00
Uncut railroad mixed	8.50 to 9.00
Horseshoes	11.00 to 11.50
Railroad brake shoes	9.50 to 10.00
Railroad springs	12.00 to 12.50

Cincinnati

CINCINNATI, Nov. 15.

Pig Iron.—Southern irons, on a sale of 1000 tons to a sanitary manufacturer for its Louisville plant, are $1 lower than a week ago, the price now being $18, Birmingham base. It is reported that some resale Southern iron had been sold at slightly under this figure, but confirmation is lacking. The prices from other districts remain unchanged, but silicon differentials are not being strictly adhered to. While $21 is still the general asking price on southern Ohio and Chicago irons, it is said that in competitive territory $20 can be done. Lake furnaces are still quoting $20, and it is possible in some cases to buy higher silicon irons at this figure. Nothing more has been heard of Buffalo iron in this district. The market is generally quiet in the Cincinnati territory. An Indianapolis melter is reported to have bought 500 tons of foundry, half going to Chicago and half to southern Ohio. In addition a small tonnage of silvery was placed, at prices prevailing before the advances made some weeks ago. A Dayton melter bought 150 tons of Northern foundry at $22.75, delivered, and a Louisville melter 150 tons of Southern at $18.50, Birmingham. A Virginia pipe company bought 1500 tons of Virginia iron at an unnamed price, and an Illinois melter 600 tons of high silicon malleable. The only inquiry of consequence comes from the Louisville & Nashville Railroad, which is asking for 250 tons. The National Cash Register Co. has not closed on its 300-ton inquiry for January shipment. The Ashland Iron & Mining Co. blew in a furnace on basic Saturday and it is reported that the Portsmouth stack will go in shortly.

Based on freight rates of $4.50 from Birmingham and $2.52 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$22.50
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	23.00
Ohio silvery, 8 per cent sil.	30.02
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	$22.52 to 23.52
Basic, Northern	22.02
Malleable	23.52

Finished Material.—With two holidays coming in one week, the steel business was rather quiet. Some

carload orders were placed, however, mostly for fill-in purposes. Some sheet mills are now quoting 3.75c. on galvanized sheets, the prices on blue annealed and black sheets remaining at the former levels. A northern Ohio mill booked 100 tons of reinforcing bars for immediate delivery at 1.65c. The usual quotation, however, on bars, shapes and plates still remains at 1.60c. Several good sized inquiries for reinforcing bars are being figured on, including about 200 tons for the new Elks temple and several hundred tons for the addition to the Hotel Gibson, the contract of which has been awarded to the Wells Bros. Construction Co. Bids will close Nov. 25 for the Elks temple, a five-story building, which will take about 250 tons of structural steel. This is the only project of size to come up during the week. It is reported that a manufacturer in this territory has placed an order for several thousand boxes of tin plate at a slight concession from the official price of $4.75 per base box. There will be very little change in plant operations during the coming week. The American Rolling Mill Co. at Middletown is operating its East Side plant full time, and the Whitaker-Glessner Co., Portsmouth, is reported to be putting on several additional mills. The plants of the Ashland Steel Co. and the Ashland Iron & Mining Co. are scheduled to resume operations in the near future. The plants of the Newport Rolling Mill Co. and the Andrews Steel Co. are still down, the difference between the management and its employees not having been settled.

Warehouse Business.—Some jobbers report a slight improvement during the past week, cold rolled steel and bolts and nuts showing fair activity. Prices are firm.

Tool Steel.—Some increased activity is noticed in the demand for tool steels and October was the best month since last spring. Up to date this month, orders are also showing a steady increase. Prices are firm and unchanged, 18 per cent tungsten high speed steel being quoted at 90c. per lb. base.

Iron and steel bars, 3c. base; hoops and bands, 3.75c. base; shapes, 2.85c. base; plates, 2.85c. base; reinforcing bars, 3.07½c. base; cold rolled rounds, 1½ in. and larger, 4.10c.; under 1½ in. and flats, squares and hexagons, 4.75c.; No. 10 blue annealed sheets, 3.50c.; No. 28 black sheets, 4.25c.; No. 28 galvanized sheets, 5c.; wire nails, $3.25 per keg base, No. 9 annealed wire, $3.00 per 100 lb.

Coke.—A sale of 600 tons of furnace coke featured the market during the week. Otherwise business was light. Prices are practically unchanged from last week, though with a softer tendency.

Old Material.—The scrap market remains quiet with the occasional small sales reported. Some of the larger consumers who had been taking in material for some time past have asked dealers to hold up shipments. Locally business is quiet.

We quote dealers' buying prices, f.o.b. cars:

	Per Gross Ton	
Bundled sheets	$4.50 to	$5.50
Iron rails	12.50 to	13.00
Relaying rails, 50 lb. and up	25.50 to	26.50
Rerolling steel rails	11.00 to	12.00
Heavy melting steel	9.50 to	10.00
Steel rails for melting	9.50 to	10.50
Car wheels	12.50 to	13.50
Per Net Ton		
No. 1 railroad wrought	9.00 to	10.00
Cast borings	3.50 to	4.00
Steel turnings	2.50 to	3.00
Railroad cast	12.50 to	13.00
No. 1 machinery	14.00 to	15.00
Burnt scrap	8.00 to	9.00
Iron axles	16.00 to	17.00
Locomotive tires (smooth inside)	10.00 to	10.50
Pipes and flues	4.50 to	5.50

Herbert A. Pike, formerly president and treasurer Boston Pressed Metal Co., Worcester, Mass., has sold his interest in that company to William Sanger, Toledo, Ohio. Douglas P. Cook, vice-president and general manager, becomes president and general manager, retaining his original interest in the concern. The Boston Pressed Metal Co., established in 1906, is capitalized at $100,000. Mr. Cook has been associated with it 14 years. Mr. Sanger has not been actively engaged in business the past two years. Previously he was manager of the Clouss Shear Co., Fremont, Ohio. He plans to make his headquarters in Worcester, and, as treasurer of the company, take an active part in its management.

Birmingham

BIRMINGHAM, ALA., Nov. 15.

Pig Iron.—The market ruled from $18 to $19 during the week. The lower price came about through putting on the market of overdue iron for sale on account of customers. At least this is the opinion of makers, who ran into this resale or realization iron and claim to have been forced to cut to $18 and $18.50 to get business in competition. There was sacrifice of differentials, lots of two differentials above base selling at base price, which read back $1 under market. One maker sold a half dozen lots aggregating 500 tons, the largest 350 tons, at $19 and got all differentials. Another maker, running into the resale iron, sold at $18 and $18.50, but also sold at $19. The weaker tone does not appear to have backing other than this resale metal and the belief is expressed that the market will rebound as soon as that movement stops. One maker did the best week's business in a long time. A total of 4000 to 4500 tons was done. One lot of 900, another of 600 and three of 500 tons were in the transactions, others being for smaller amounts. Some Pacific Coast business was done last week. Base is understood to have been around $18. Several lots of charcoal iron were also sold, car wheel makers reappearing for lots of 100 tons. The iron brought the base of $35. The stock situation at the beginning of the month was still further improved. Stocks on Alabama yards Oct. 1 and Nov. 1 were: foundry, 68,000 and 54,000; machine cast, 38,000 and 32,000; warrants, none and 5900; basic, 58,000 and 50,000; total, 165,000 and 144,000. The warrants are the first on yards in many months. The outgo is still brisk.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$18.00 to	$19.00
Basic	17.00 to	18.00
Charcoal, warm blast		35.00

Finishing Mills.—Wire drawing mills sense an easing up in new orders following lower cotton prices, but operations average about the same as October, which was 70 per cent. The Tennessee company shifted from the operation of the structural mill to the plate mill this week, other operations continuing as they have for several weeks, which is 55 per cent of finishing mill production. Structural steel and galvanized sheets remain active throughout the Southeast. Band and hoop mills are resting a week.

Cast Iron Pipe.—Additional western orders were taken by the National Cast Iron Pipe Co. and American Cast Iron Pipe Co. High pressure pipe remains fairly active. Sanitary pipe had best October, following the best August on record, owing to large sales of extra heavy pipe at low figure in the East. Demand has eased off since rush shipments made when the threat of a railroad strike existed. The market remains at $40 in most instances with two interests holding at $45 and one making a differential of only $5 between standard and extra heavy. High pressure base is $33 to $35.

Coal and Coke.—Coal production has reached approximately normal, but indications point to smaller demand since the threat of a railroad strike eased up domestic coal dealers and some steam coal users. Coke as a rule has eased up somewhat. Base is $5.50 to $6.

Old Material.—Demand for cast scrap is good and prices are firm. Steel is weak and apparently at dictation of buyers owing to freight rates preventing competition far afield.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$11.00 to	$12.00
No. 1 steel	10.00 to	11.00
No. 1 cast	15.00 to	16.00
Car wheels	15.00 to	16.00
Tramcar wheels	12.00 to	13.00
No. 1 wrought	13.00 to	14.00
Stove plate	11.00 to	12.00
Cast iron borings	6.00 to	7.00
Machine shop turnings	6.00 to	7.00

Buffalo

BUFFALO, Nov. 15.

Pig Iron.—Quotations of $20 base on No. 2 plain with differentials of 50c. for each advance of 50 points in silicon, prevail on small lots such as a carload or 100 tons, but on sizable tonnages price concessions are made in almost every instance. Radiator interests have purchased 4000 tons, the order divided between two Buffalo furnaces. The price was under $20, but the exact figure is not available. Inquiry has dropped and 8000 tons inquired for in scattered lots is in the hands of one producer. In this group there is but one inquiry for 1000 tons, a few for 500 tons and the rest 100 tons or less. The furnace which has this business to work on placed about 3500 tons in orders of the same character last week. Iron for 1922 has not made an appearance as yet either in orders or inquiry. Producers are not especially anxious to quote for next year delivery nor have they been called upon. The M. A. Hanna & Co. will blow in a furnace Nov. 20. The only stack in blast this year has been down for relining.

We quote f.o.b. dealers' asking prices per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.	$20.00
No. 2X foundry, 2.25 to 2.75 sil.	19.50
No. 2 plain, 1.75 to 2.25 sil.	19.00
Basic	21.00
Malleable	21.00
Lake Superior charcoal	31.75

Finished Iron and Steel.—The depression which set in when the strike atmosphere cleared is unchanged and with the exception of sheet and pipe demand, the market is apathetic. In sheets one interest has almost normal business and demand for pipe has held up longer than expected. A bolt and nut inquiry embracing 250 tons for a car repair plant has not been placed. Tin plate orders have appeared in satisfactory numbers notwithstanding seasonal falling off was expected several weeks ago. In structural shapes some desirable business is in prospect. The Merchants Despatch at Rochester, a railroad subsidiary, will erect two buildings, one involving 500 tons and the other 100 tons. Bar business is quiet with all sellers. No 1922 rail orders have been placed with the leading rail mill, but two roads are in the market and one is expected in soon. It is likely much of their needs will be rolled here. William J. Conners, identified with lake shipping along the Great Lakes, has leased the East Buffalo car shops of the New York Central Railroad and expects to have full-time operation by Dec. 1. Inquiry for small lots of structural shapes has fallen off, but a number of orders have been booked by a structural mill with no individually large tonnages involved. The Buffalo mill which quoted bars and shapes for the Navy Department at 1.40c. and 1.50c. respectively bid at prices which no other Buffalo interest cared to quote. The $4,500,000 filtration plant referendum in Buffalo passed at the recent election and plans will soon be authorized. The Lackawanna Bridge Co. is low bidder on the city viaduct work, Buffalo, on which several hundred tons of shapes will be used.

Old Material.—Generally the situation is about on the plane of last summer when complete stagnation prevailed. The mills which bought steel a few weeks ago have apparently filled their wants for some time to come and are disinterested in further purchases, particularly in steel. There is belief that stronger prices will be heard of soon, but there is nothing in the way demand shapes up, to give this expectation weight.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$13.00 to $14.00
Low phos., 0.004 and under	16.50 to 17.50
No. 1 railroad wrought	13.00 to 14.00
Car wheels	16.00 to 17.00
Machine shop turnings	7.00 to 8.00
Cast iron borings	7.00 to 8.00
Heavy axle turnings	10.00 to 11.00
Grate bars	11.00 to 12.00
No. 1 busheling	10.00 to 11.00
Stove plate	14.50 to 15.00
Bundled sheet stampings	8.00 to 9.00
No. 1 machinery cast	17.00 to 17.50
Hydraulic compressed	10.50 to 11.50
Railroad malleable	13.00 to 14.00

Warehouse Business.—Dullness which characterized the market for the last three weeks is still apparent and little improvement is expected to take place this year. Orders are not as plentiful as in September and with the exception of some ship repair work which develops with the close of lake navigation, the general prospect is not encouraging. New prices became effective Nov. 11 on several commodities.

We quote warehouse prices f.o.b. Buffalo as follows: Structural shapes, 2.80c.; plates, 2.80c.; plates, No. 8 gage, 3.50c.; soft steel bars and shapes, 2.70c.; hoops and bands, 3.30c.; blue annealed sheets, No. 10, 3.55c.; galvanized steel sheets, No. 28, 5.25c.; black sheets, No. 28, 4.25c.; cold-rolled strip steel, 5.90c.; cold-rolled round shafting, 3.80c.

San Francisco

SAN FRANCISCO, Nov. 9.

Pig Iron.—Although foundry activities continue very much restricted, there appears to be an increasingly better business from manufacturers of sanitary products. Foreign exchange and low freight rates still favor trading in Continental iron and the bulk of actual sales on the Coast is in these foreign offerings. The Southern Pacific Co. seems to be the main source of demand for domestic pig iron, that company just having closed bids for 850 tons, 250 tons of malleable, 350 tons analyzing 1.75 to 2.25 silicon and 250 tons of 2.25 to 2.75. The price is believed to be around $18, Birmingham basis. One importer recently has sold about 500 tons of Belgian material at something about $26, ex ship, San Francisco. A foundry has purchased 200 tons, but the price was not disclosed. About 300 tons of re-sale iron were moved, the price involved being reported slightly over $30, f.o.b. cars.

Cast Iron Pipe.—After the rather heavy demand a few weeks ago, the situation has quieted of late, as far as new prospects are concerned. The city of Long Beach, Cal., rejected first bids on 1750 tons of 4, 6, 8, 12 and 20-in. pipe and is asking for new bids on Nov. 15. Glendale has placed an order for 600 tons with the American Cast Iron Pipe Co. There continues a steady business from private sources. The price of $33 base is unchanged.

Finished Iron and Steel.—During the past week or two, the industry on the Coast has relapsed and continues quieter at this time. Prices also appear unsettled, and in certain products price cutting prevails. This condition applies particularly to plates and shapes. The market price on galvanized sheets a short time ago was 4c., but today figures as low as 3.75c. are heard, especially when an attractive tonnage seems to offer. It is believed that the falling off of interest in steel products is partly due to the lateness of the season, when many operators are desirous of keeping their stocks at a minimum, and also is the result of the general unsettled conditions, this retarding new building operations and the consequent consumption of bars. There is, however, one inquiry for 200 tons of reinforcing bars, and another involving 600 tons of structural materials for an out-of-town job. Some demand for rails from Japan and China is a brighter feature, along with a little export inquiry for tin plate and sheets.

Coke.—The inquiry for 600 tons of coke by the Southern Pacific Co., bids for which closed Nov. 8, is the only conspicuous business offering in this market at present. Smelting interests have taken some foreign coke, but general interest is rather light.

Old Material.—There has been a little improvement in scrap, but business cannot be termed active in any sense. Buying seems to be principally in cast iron scrap, the movement of which is fairly steady. The market price is considered about $20, but a straight car was sold a few days ago at $17, delivered. This, however, was not high grade material.

J. W. Dickson, who retired as vice-president and Pittsburgh district sales manager of Park & Williams, Inc., on Nov. 1, to go into business for himself, has opened offices at 605 Columbia Bank Building, Pittsburgh, and will do a brokerage business in pig iron, ferroalloys, coal and coke.

British Iron and Steel Market

Pig Iron Prices Weakening—Steel Deliveries from Continent Delayed—Tin Plate Situation Improving

(By Cable)

LONDON, ENGLAND, Nov. 15.

Demand for Cleveland pig iron is slow and prices are weakening, but the main hindrance are railroad rates, which are still 150 per cent above pre-war levels. French forge pig iron has sold at 105s. ($20.79), delivered Midlands, but Continental supplies are generally diminishing, owing to delayed deliveries. Hematite iron is weaker and makers are unable to dispose of a limited production.

Wales has bought a fair tonnage of low grade Spanish ore. Bilbao Rubio is quoted at 26s. ($5.14), ex-ship Tees.

Scottish shipyard steelmakers have abandoned their price-fixing policy. English makers are booking more orders, chiefly for home consumption, at current values but the position is generally still bad. Continental business with Britain is diminishing, mainly owing to bad deliveries. Germany is asking 12 weeks shipment and upward.

German merchant bars are quoted at £8 to £8 5s. ($31.68 to $32.67) f.o.b.; German wire nails at 14s. 6d. to 16s. 6d. ($2.85 to $3.26) base, f.o.b. for shipment early in the spring; German plates at £7 10s. to £8 ($29.70 to $31.68) f.o.b.; French shapes at £8 2s. 6d. to £8 5s. ($32.17 to $32.67) f.o.b.; Belgian No. 3 bar iron at £7 15s. 6d. to £8 5s. ($30.69 to $32.17) f.o.b. Belgian billets are quoted at £9 ($35.64) delivered Midlands and French billets at £6 10s. ($25.74) f.o.b. Saar Valley, with merchant bars at £8 2s. 6d. to £8 10s. ($32.18 to $33.66) f.o.b. America is quoting billets at £9 ($35.64) c.i.f.

The tinplate turnover is increasing and costs are declining. Home consumers are buying odd sizes steadily at 21s. 3d. ($4.18) base, f.o.b. paid for forward delivery, buyers' option. Contracts for first quarter are quoted at 21s. ($4.16) f.o.b. The Near Eastern demand for quarter wasters is forcing values up. After doing business up to 19s. 6d. ($3.86) f.o.b., sellers are asking 20s. ($3.96) f.o.b. Galvanized sheet makers are firm at £18 ($71.28) f.o.b. January shipment. Merchants have sold at £17 15s. ($70.29) f.o.b., anticipating lower values. Far Eastern specifications for black sheets have sold (January) at £18 17s. 6d. ($74.62) f.o.b.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $3.96 per £1 as follows:

Durham coke, delivered	£1 10	$5.94
Cleveland basic	7 7½ & £7 10*	29.20 & $29.70
Cleveland No. 1 foundry	5 15	22.77
Cleveland No. 3 foundry	5 10	21.78
Cleveland No. 4 foundry	5 5	20.79
Cleveland No. 4 forge	5 0	19.80
Hematite	7 0*	27.72
East Coast mixed	5 15	22.77
Ferromanganese	15 0 & 14 10*	59.40 & 57.42
Rails, 60 lb. and up	9 10 to 10 10	37.62 to 41.58
Billets	7 2½ to 8 5	28.62 to 32.67
Sheet and tin plate bars, Welsh	7 0 to 7 15	27.72 to 30.69
Tin plate base box	1 1 to 1 2½	4.16 to 4.46
		C. per Lb.
Ship plates	10 10	1.856
Boiler plates	15 0 to 16 0	2.65 to 2.83
Tees	10 15 to 11 10	1.90 to 2.03
Channels	10 0 to 10 15	1.77 to 1.90
Beams	10 0 to 10 10	1.77 to 1.85
Round bars, ¾ to 3 in.	11 10 to 12 0	2.03 to 2.12
Galvanized sheets, 24 g.	17 15 to 18 5	3.10 to 3.19
Black sheets	15 0 to 16 0	2.65 to 2.83
Steel hoops	14 5 & 14 0*	2.51 & 2.47
Cold rolled steel strip, 20 g.	24 10	4.33

*Export price.

Price Cutting for Export—Cleveland Pig Iron Lower—New Steel Company in India

LONDON, ENGLAND, Nov. 2.—Price cutting continues without, however, attracting buyers. The latest move in the right direction is a drop of 10s. to 14s. in the price of Cleveland pig iron, which doubtless will be followed by other makes. Pig iron, however, at 110s., taking No. 3 Cleveland as the basis, is still too dear and another fall of 10s. will have to take place if trade is to revive. Costs are the stumbling block and though wages are coming down, coal and coke still remain at impracticable levels. Hematite is hard to sell and here too prices are being forced down, East Coast mixed numbers being worth no more than 120s., only 10s. more than foundry iron.

Some workers are at last beginning to realize the fallacy of holding out for extravagant wages, and it is encouraging to note that the engineering and shipbuilding unions have decided to accept the masters' intention to withdraw the war bonuses which Mr. Churchill, when minister of munitions, granted to munition and piece workers.

English steel makers are more and more cutting prices for export business and would doubtless do so for home business were they not bound by associations. At the present time in some cases English steel is being sold at only 20s. more than continental makers ask, and when it is seen that continental producers can only offer almost indefinite shipment against practically immediate shipment as offered by English plants, it is not surprising that the shipper prefers to pay a little more for English material. Scotch makers, however, are unable to compete with English makers, their costs of production being higher, as they have to import much of their raw material and, at a basis price of £10 15s., which is 30s. more than English, are said to be incurring a loss of £4 a ton on manufacture.

A new company has recently been formed in India, called the United Steel Corporation of India, Ltd., and having a capital of 20 crores of rupees. The parties concerned are Messrs. Bird & Co., Calcutta, and Messrs. Cammell Laird & Co., of Sheffield. The board of directors include Lord Cable, Lord Inchcape, Lord Merton and W. L. Hichens. The plant, plans of which are well along, will have an annual capacity of 600,000 to 700,000 tons of pig iron and the rolling mills will be able to turn out 450,000 tons of finished steel a year. Offices are also to be established in London.

Iron and Steel Imports of Great Britain

British imports of iron and steel for nine months in 1921 showed a total of 1,135,791 tons, compared with 670,257 tons last year and 1,501,564 tons for the corresponding period of 1913. The figure is thus 25 per cent below 1913, but 69½ per cent higher than last year.

More than one-third of this year's total consisted of pig iron and ferroalloys, 432,349 tons, or nearly three times the quantity in 1920 or 1913. Billets and slabs accounted for 211,619 tons—about the same as 1920, but only 37 per cent of 1913. Plates and sheets, 109,501 tons; iron bars, rods, angles, etc., 102,595 tons; steel bars, rods, angles, etc., 89,310 tons; and rails, 39,969 tons, were the next largest items in 1921.

The Alabama Power Co., by acquiring temporary lease of the Government power plant at Sheffield, adds 110,000 hp. to its quota of steam-generated power, the remainder being 75,000 hp. at the plant on the Warrior River near Birmingham and 15,000 hp. at the Gadsden plant. By connection with the Georgia power lines, which are connected with the Carolina lines, the Alabama Power Co. has been furnishing power to operate Carolina cotton mills and other industries 400 miles distant and relieve a low water distress. Mitchell dam, being built on the lower Coosa River, will require two years to finish. It will generate 120,000 hp., the same as is generated now normally at the dam at lock 12 on the same river.

FAIR EXPORT ACTIVITY

Japan Buys 78 Miles of Wire and Places Rail Tonnage—New Steel Works in India

NEW YORK, Nov. 15.—Japanese buying, although not quite so heavy as formerly, is still about the largest item with most exporters. Orders being placed in the United States and new inquiries issued include wire, wire nails, rails, tin plate, steel bars, sheet bars and blue annealed and black sheets. In wire, one export house has booked an order for a total of 78 miles of ⅝-in. (125,000 circular mils) wire, to be used on transmission towers of the Tokio Electric Light Co. and 200 tons of No. 8 gage plain wire for electrical purposes. An order was recently booked by a New York export house for 100 tons of prime western spelter in ingots, and an inquiry is in the market for 1000 tons of electrolytic copper for Japan.

The recent inquiry for a total of 8000 tons of 60-lb. and 75-lb. rails for Yokohama, Kobe and Otaru, Japan, has been placed through a Japanese house in the United States at a price said to be $46.51 per ton for the 75-lb. rails, c.i.f. Yokohama and Kobe, and $47.25 per ton, c.i.f. Otaru, for the 60-lb. rails. Orders for tin plate, although not as numerous now, still continue. A New York export house has booked 5000 base boxes of oil can size tin plate for Japan. About 200 tons of sheet bars for Japan is reported by another exporter.

Besides the orders for iron and steel products being placed by Japan in the United States, the Far East, according to reports, is purchasing in Belgium, Germany, Austria and Czecho-Slovakia. In some instances, when the mark started its recent downward course of depreciation, British re-exporting interests and Japanese purchasers bought up the entire output of German mills for some time. Aside from the difficulty in obtaining delivery from Germany to the United States, dealing with German mills is difficult at present because of the general price uncertainty in the German market. Some time ago negotiations were entered into between a dealer in this country and the American representative of a German mill for an order of 28,000 kegs of wire nails. The order was placed, but at the last moment the German mill refused to fill it, because of inability to make delivery before the spring of 1922 or later. In order to hold up prices for export, despite the rapid fall of the mark, which is not entirely offset by the rise in domestic prices in Germany, exporters there are beginning to add percentages to the domestic quotation, which in some instances run from as high as 800 per cent to 1900 per cent. While iron and steel imports into the United States from Germany are at a minimum, some agents report a fairly active business in cement tiles, bricks and other building materials.

Bird & Co., Calcutta, India, and Cammell, Laird & Co., Sheffield, England, have incorporated the United Steel Corporation of Asia, Ltd. According to *Engineering*, London, works on a large scale will be erected near the iron ore, coal and limestone deposits in India, much of which is controlled by Bird & Co. Cammell, Laird & Co., Ltd., will be responsible for the design, erection and personnel of the works. The plant will be designed for the production of 600,000 to 700,000 tons of pig iron and 450,000 tons of finished material, but will operate at about one-half this rate.

The Victorian Government Railway Commissioners, Melbourne, Australia, have issued a call for bids on a list of material which includes double-headed screw machines and forging machines for the Newport shops, bids closing Dec. 14. Closing Jan. 4, bids have been asked on 60 tons of galvanized telegraph wires and 150 electric train stops for power signaling.

Engineering Meetings in December

Engineering meetings in December arranged for sections of the American Society of Mechanical Engineers include the following:

Dec. 6, Waterbury, Conn., address on "Belting" by A. C. Moore, Charles A. Schieren Co.

Dec. 7, Buffalo, N. Y., address on "Researches Into Foundry Practices" by Enrique Touceda, consulting engineer American Malleable Casting Association, Albany.

Dec. 9, Murphy's Hotel, Richmond, Va., "The Engineer in Foreign Trade."

Dec. 9, Auditorium of Interior Department, Washington, address on "Engineering Standardization" by A. A. Stevenson, chairman American Engineering Standards Committee.

Dec. 15, Hotel Stratfield, Bridgeport, Conn., address on "World Wide Industrial Conditions" by Dr. Magnus W. Alexander, chairman National Industrial Conference Board.

Dec. 15, Toledo Edison Co.'s auditorium, Toledo, Ohio, illustrated address on "Gas Manufacture" by A. Johnson, Atlas Chemical Co., Toledo; address on "Industrial Fuel" by Henry O. Loebell, Henry L. Doherty Co., New York.

Dec. 16, Bayonne, N. J., address on "Pulverized Fuel from the Operating Standpoint," following an inspection of the plant of the Babcock & Wilcox Co.

Dec. 19, at building of Hartford Electric Light Co., Hartford, Conn., subject, "Refrigeration and Air Conditioning," following a dinner at the Bond Hotel.

Dec. 20, at Engineers Club, Philadelphia, symposium on materials handling.

Foundrymen at Cleveland

For the convention and exhibit of the American Foundrymen's Association, to be held at Cleveland in the week of April 24, 1922, the association headquarters and exhibits will be in the new Cleveland public hall at Lakeside Avenue and East Ninth Street. The Institute of Metals division of the American Institute of Mining and Metallurgical Engineers announces that it will hold a joint convention with the foundrymen as has been the custom for a number of years. The new public hall at Cleveland is but a few minutes' walk from the downtown hotels and is directly across the street from the old Central Armory where the first foundry equipment exhibit was held in conjunction with the meeting of the American Foundrymen's Association in 1906.

Cleveland was selected for its central location, which makes possible a saving in traveling expenses and in the transportation cost to the exhibiting manufacturers of foundry equipment and supplies. Following the last convention by an interval of 18 months that at Cleveland is looked forward to with interest by the foundry and connected trades. The committee on papers announces that a number have already been received and that the first set of preprints will be mailed to the membership in January.

Stanley P. Rockwell spoke on case hardening before the Hartford Chapter, American Society for Steel Treating, Hartford, Conn., last week. He described case hardening on a large scale as well as the advantages and disadvantages of the various treatments and materials used in commercial operations. Mr. Rockwell has had wide experience in case hardening while with the New Departure Mfg. Co., Bristol, Conn., the Whitney Mfg. Co., Hartford, and other large concerns. George P. Moore, Wallace Barnes Co., Bristol, will speak before the chapter at its next meeting, Dec. 9.

The Design of Tools, Jigs and Fixtures was the subject of Charles J. Hall, chief designer Taft-Peirce Mfg. Co., Woonsocket, R. I., at a meeting last week of the designing and drafting section, Providence Engineering Society, Providence, R. I.

The Carnegie Steel Co. has put on another blast furnace at its Ohio Works, Youngstown, making a total of 5 of the 6 furnaces at that works now making iron. This addition brings the number of active Carnegie Steel Co. stacks to 21, out of a total of 59.

MODERATE ACTIVITY

Basic Pig Iron and Sheets Weak in the Mahoning Valley District

YOUNGSTOWN, OHIO, Nov. 15.—Though operations are fairly well maintained, the steel industry in the Mahoning Valley is drifting into a period of more moderate activity. New buying is slackening in sheets and strip steel, though it is firm in tin plate. A number of the larger can makers are seeking material for their 1922 requirements, involving heavy tonnages and such business is now occupying the capacity of district makers well toward 90 per cent. In fact, in all lines of finished steel, jobbers and manufacturing consumers are inquiring for material to cover their first quarter, 1922, requirements.

Finishing mills are operating this week at fully 60 per cent, with sheet mill capacity engaged to the extent of about 70 per cent. Sharon Steel Hoop Co. is operating four sheet mills at its Haselton works, Youngstown, after repairing a damaged coupling to the main driving shaft, which held up operations for two weeks. Of the 66 open-hearth furnaces in the Valley, 45 are charged. Pipe mill schedules continue with little change, with nine of 17 furnaces fired.

The Republic Iron & Steel Co. has been operating its plate mill, using the output for lapweld pipe. The Republic company has enlarged its sheet mills schedules, having the power on 14 mills this week, as compared with 12 last week.

Basic Pig Iron Weak

An unfailing index of the general situation with regard to prices is found in basic pig iron, which is being quoted at $19 by the larger steel works interests, while attractive tonnage, it is admitted, would command a lower price. In fact, some resale iron is reported to have been offered in this territory at $18.50. It is considered quite likely that district steelworks plants would negotiate sales of surplus iron stocks on some such basis, charging any loss in production to a marked down inventory.

One integrated interest which has been operating its single blast furnace since July 1 has been piling an average of about 2000 tons of iron in the meantime, in addition to the tonnage consumed by its steel department. The company acknowledges that it could have purchased iron at lower prices on the market, but figures that it is liquidating high-priced ore in the conversion process.

Another Valley interest which has been preparing to start a new stack has now deferred the date of turning on the blast, owing to recession in the price of pig iron. As a consequence, the furnace may not now start until spring, though raw materials have been assembled in sufficient quantity to start at any time. This company has been inquiring for 2000 tons of iron.

Sheet buying varies with different interests, though current tonnage moving from the mills is principally on specifications. Large tonnages of sheets of roofing quality have moved from this district. Jobbing mill sizes have been in limited demand and the jobbers of several interests have been idle for over a month. Quotations of 3.25c. and 4.25c. for black and galvanized grades respectively, put forth by a number of independents led by the Brier Hill Steel Co., have disappeared for the time being. The market is actually nearer 2.25c. for blue annealed, 2.75c. for common sheets and 3.75c. for galvanized, all base gages.

The average of 2.75c. for Nos. 26, 27 and 28 gage black sheets shipped during the past two months, as disclosed by the latest bi-monthly settlement, indicates that the higher prices did not prevail to any extent. A considerable volume of No. 28 gage black moved at 3c., however. The sales average is brought down due to the fact that substantial tonnages of No. 26 gage were shipped by several of the subscribing interests. Ordinarily No. 26 gage is sold at $2 per ton less than No. 28 gage, and No. 27 gage at $1 per ton less than No. 28. Several producers reported sales of No. 28 gage at 2.90c., against which shipments had been made.

Full finished sheets are in less demand from the automobile industry, though other users, among them makers of metal furniture, are in the market for somewhat larger tonnages. This grade of sheets is scarcely firm at 4.35c. for No. 22 gage auto body stock.

Inquiries for Plates

Inquiries aggregating between 4000 and 5000 tons have been before plate makers the past two weeks, coming largely from tank car interests. Some new tank car construction is under way, while there is a large volume of repair work, some plants being engaged wholly on the latter. Due to keen competitive conditions in plates, makers in nearby districts are reported to have accepted tonnage at 1.50c. The range on prices in the Valley is from 1.60c. to 1.70c., higher prices which were recently put out having been withdrawn.

Indications coming to the attention of district wire makers are that the attempt of the leading interest to drive in business at current levels, in likelihood of an advance, has failed to show strength. The contemplated increase may therefore be deferred, in which event current quotations of $2.60 for plain wire and $2.90 per base keg for nails are unlikely to continue firm. In fact, it has only been until recently that the principal independent maker in this territory has revised its prices upward in conformity with quotations of the American Steel & Wire Co.

Mineral Industry Will Co-operate With Secretary Hoover

WASHINGTON, Nov. 15.—Plans looking to close co-operation between the mineral industry and the Department of Commerce for the development of export trade were discussed yesterday at a meeting between Secretary Hoover and representatives of the industry, speaking for three branches, metals, coal and oil. J. G. Bradley, president National Coal Association, was named chairman and secretary. J. T. Callbreath, American Mining Congress, was made secretary of the committee under which are subcommittees, which will select additional members and after conferences with operators will make recommendations to the mining congress to be laid before Secretary Hoover. Bulkley Wells was made chairman of the subcommittee on metals; George S. Davison, president Gulf Refining Co., chairman subcommittee on oil, and T. H. Watkins, president Pennsylvania Coal & Coke Corporation, chairman of the subcommittee on coal.

The general committee on metals includes F. B. Richards, Lake Superior Iron Ore Association, iron ore; Edgar Z. Wallower, president Golden Rod Mining Co., zinc; B. B. Thayer, copper, and Bulkley Wells, gold.

American Iron and Steel Institute Meeting

Arrangements have been completed for the meeting of the American Iron and Steel Institute to be held at the Hotel Commodore, New York, Friday, Nov. 18. Following the delivery of the presidential address by Judge Gary in the morning, papers will be read at the morning and afternoon sessions. At the dinner in the evening, the guest of honor will be Marshal Foch of France, and he will be accompanied by General Pershing. It is expected that there will be more than 1500 guests.

The one-story building at 229-31 North Twenty-third Street, Philadelphia, recently leased by the Robbins & Myers Co., Springfield, Ohio, as referred to in THE IRON AGE, Nov. 3, will be occupied only as a warehouse and no manufacturing will be carried on.

A blast furnace, said to be the first in Argentina, has recently been installed near the city of Jujuy, says the London *Iron and Coal Trades Review*. There are deposits of iron ore in the vicinity. The furnace is producing about 24 tons of pig iron per day.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight Rates

Freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic	$0.35	Kansas City	$0.815
Philadelphia, export	0.265	Kansas City (pipe)	0.77
Baltimore, domestic	0.335	St. Paul	0.665
Baltimore, export	0.255	Omaha	0.815
New York, domestic	0.38	Omaha (pipe)	0.77
New York, export	0.285	Denver	1.35
Boston, domestic	0.415	Denver (wire products)	1.415
Boston, export	0.285	Pacific Coast	1.665
Buffalo	0.295	Pacific Coast, ship plates	1.335
Cleveland	0.24	Birmingham	0.765
Detroit	0.325	Jacksonville, all rail	0.555
Cincinnati	0.325	Jacksonville, rail and water	0.46
Indianapolis	0.345	New Orleans	0.515
Chicago	0.38		
St. Louis	0.475		

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver, the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 55c.; ship plates, 75c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 75c.; sheets and tin plates, 60c. to 75c.; rods, wire rope, cable and strands, $1; wire fencing, netting and stretcher, 75c.; pipe, not over 8 in. in diameter, 75c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural sizes, 1.50c. to 1.60c.

Sheared plates, ¼ in. and heavier, tank quality, 1.50c. to 1.60c.

Wire Products

Wire nails, $2.90 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.25 and shorter than 1 in., $1.75; bright Bessemer and basic wire, $2.60 per 100 lb.; annealed fence wire, Nos. 6 to 9, $2.60; galvanized wire, $3.10; galvanized barbed wire, $3.55; galvanized fence staples, $3.55; painted barbed wire, $3.05; polished fence staples, $3.05; cement-coated nails, per count keg, $2.45; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days, net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 68 to 70½ per cent off list for carload lots, 67 to 69½ per cent for 1000-rod lots, and 66 to 68½ per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$2.25 to $2.40 base
Large boiler rivets.....2.35 to 2.50 base
Small rivets .....70, 10 and 5 to 70, 10 and 10 per cent off list
Machine bolts, small, rolled threads,
70, 10 and 5 to 70, 10 and 7½ per cent off list
Machine bolts, small, cut threads,
70 and 5 to 70 and 10 per cent off list
Machine bolts, larger and longer,
65, 10 and 5 to 70 and 10 per cent off list
Carriage bolts, ⅜ in. x 6 in.:
Smaller and shorter rolled threads,
65, 10 and 10 per cent off list
Cut threads .....65 and 10 per cent off list
Longer and larger sizes.....65 and 10 per cent off list
Lag bolts .....70 and 10 to 70, 10 and 5 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....60 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅝ in. x 4 in.:
Smaller and shorter.....65 and 5 per cent off list
Larger and longer sizes.....65 per cent off list
Hot pressed sq. or hex. blank nuts.....$5.50 off list
Hot pressed nuts, tapped.....$5.00 off list
C.p.c. and t. sq. or hex. blank nuts.....$5.25 off list
C.p.c. and t. sq. or hex. blank nuts, tapped.....$5.00 off list
Semi-finished hex. nuts:
¼ in. to 9/16 in. inclusive.....80, 10 and 10 per cent off list
Small sizes S. A. E.....80, 10, 10 and 10 per cent off list
⅝ in. to 1 in. inclusive, U. S. S. and S. A. E.,
70, 10, 10 and 10 per cent off list
Stove bolts in packages.....80, 10 and 5 per cent off list
Stove bolts in bulk.....80, 10 and 7½ per cent off list
Tire bolts .....65, 10 and 10 per cent off list
Track bolts, carloads.....3.25c. to 3.50c. base
Track bolts, less than carloads.....4.25c. to 4.50c.

Upset Square and Hex. Head Cap Screws

½ in. and under.....75 and 10 to 80 and 10 per cent off list
9/16 in. to ¾ in.....75 and 10 to 80 and 10 per cent off list

Upset Set Screws

½ in. and under.....80,10 and 5 to 85 per cent off list
9/16 in. to ¾ in.....80, 10 and 5 to 85 per cent off list

Milled Square and Hex. Cap Screws

All sizes .....70 and 10 per cent off list

Milled Set Screws

All sizes .....70, 10 and 5 per cent off list

Rivets

Rivets, 1c. per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs, 25c. extra to buyers not under contract; small and miscellaneous lots less than two tons, 25c. extra; less than 100 lb. of a size or broken kegs, 50c. extra.

All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $40; chain rods, $40; screw stock rods, $45; rivet and bolt rods and other rods of that character, $40; high carbon rods, $48 to $52, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16-in. and larger, $2.25 base per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ½-in., ⅝-in. and 7/16-in., $2.40 to $2.50 base; 5/16-in., $2.40 to $2.50 base. Boat and barge spikes, $2.40 to $2.50 base per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Track bolts, $3.25 to $3.50 base per 100 lb. Tie plates, $2 per 100 lb. Angle bars, $2.40 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $9.30 per package; 8-lb. coating, I. C., $9.60; 15-lb. coating, I. C., $11.80; 20-lb. coating, I. C., $13.00; 25-lb. coating, I. C., $14.25; 30-lb. coating, I. C., $15.25; 35-lb. coating, I. C., $16.25; 40-lb. coating, I. C., $17.25 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars, 1.50c. to 1.60c. from mill. Refined bar iron, 2.15c. to 2.25c.

Welded Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	54½	28	¼ to ⅜	+ 3½	+22½
¼ to ⅝	57½	31	½	36½	18½
½	62½	48	¾	42½	27½
¾	66½	54	1 to 1½	44½	29½
1 to 3	68½	56			

Lap Weld

2	61½	49	2	39½	25½
2½ to 6	65½	53	2½ to 6	42½	29½
7 to 8	62½	49	7 to 12	40½	27½
9 to 12	61½	48			

Butt Weld, extra strong, plain ends

⅛	50½	33	¼ to ⅜	+ 4½	+37½
¼ to ⅜	53½	35	½	35½	23½
½	59½	48	¾	42½	28½
¾	64½	53	1 to 1½	44½	30½
1 to 1½	66½	55			
2 to 3	68½	56			

Lap Weld, extra strong, plain ends

2	59½	48	2	40½	27½
2½ to 4	63½	52	2½ to 4	43½	31½
4½ to 6	62½	51	4½ to 6	42½	30½
7 to 8	58½	45	7 to 8	35½	23½
9 to 12	52½	39	9 to 12	30½	18½

To the large jobbing trade the above discounts are increased by one point, with extra discounts of 5 and 2½ per cent.

Boiler Tubes

The following are the discounts for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	26½	1½ in.	5
2 to 2¼ in.	41	1¾ to 1⅞ in.	15
2½ to 3 in.	52	2 to 2¼ in.	25
3¼ to 13 in.	57	2½ to 3 in.	30
		3¼ to 4½ in.	32

Standard Commercial Seamless Boiler Tubes

New discounts have been adopted on standard commercial seamless boiler tubes, but manufacturers are not yet ready to announce them for publication, and for that reason we publish no discounts this week.

Sheets

Prices for mill shipments on sheets of standard gage in carloads, f.o.b. Pittsburgh, follow:

Blue Annealed

Cents per Lb.		Cents per Lb.	
No. 8 and heavier	2.20–2.45	Nos. 11 and 12	2.30–2.55
Nos. 9 and 10 (base)	2.25–2.50	Nos. 13 and 14	2.35–2.60
		Nos. 15 and 16	2.45–2.70

Box Annealed, One Pass Cold Rolled

Cents per Lb.		Cents per Lb.	
Nos. 17 to 21	2.55–2.80	No. 28 (base)	2.75–3.00
Nos. 22 to 24	2.60–2.85	No. 29	2.85–3.10
Nos. 25 and 26	2.65–2.90	No. 30	2.95–3.20
No. 27	2.70–2.95		

Galvanized

Cents per Lb.		Cents per Lb.	
Nos. 10 and 11	2.75–3.00	Nos. 25 and 26	3.45–3.70
Nos. 12 to 14	2.85–3.10	No. 27	3.60–3.85
Nos. 15 and 16	3.00–3.25	No. 28 (base)	3.75–4.00
Nos. 17 to 21	3.15–3.40	No. 29	4.00–4.25
Nos. 22 to 24	3.30–3.55	No. 30	4.25–4.50

Tin-Mill Black Plate

Cents per Lb.		Cents per Lb.	
Nos. 15 and 16	2.55–2.80	No. 28 (base)	2.75–3.00
Nos. 17 to 21	2.60–2.85	No. 29	2.80–3.05
Nos. 22 to 24	2.65–2.90	No. 30	2.80–3.05
Nos. 25 to 27	2.70–2.95	Nos. 30½ and 31	2.85–3.10

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin	Lead		Zinc	
Nov.	Lake	Electrolytic	New York	New York	St. Louis	New York	St. Louis
9	13.25	12.75	28.37½	4.70	4.40	5.25	4.75
10	13.25	12.87½	28.37½	4.70	4.40	5.20	4.70
12	13.25	12.87½	....	4.70	4.40	5.20	4.70
14	13.25	13.00	28.62½	4.70	4.35	5.22½	4.72½
15	13.25	13.00	28.50	4.70	4.35	5.22½	4.72½

New York

NEW YORK, Nov. 15.

Two holidays in the past week, due to election day and armistice day, have interfered with demand, but the tone of all the markets is steady to strong. Copper is higher and more active. Business in Straits tin is moderate with prices firm. Lead continues in quiet demand at unchanged quotations. The zinc market has turned quiet, but prices are steady.

Copper.—Sales of electrolytic copper, both for domestic and foreign account, are reported as steady in volume. This has resulted in an advance in prices, the minimum for electrolytic copper for early delivery being 13.25c., delivered, or 13c., refinery, with some large producers asking from ⅛c. to ¼c. higher. Interest in the first quarter is active and the minimum quotation for this position is 13.50c., delivered. Sales for foreign consumption are good at as high as 13.37½c., f.a.s. Lake copper is steady at 13.25c. to 13.50c., delivered. The statistical position of the electrolytic market is better than in many months. It is now estimated that deliveries into consumption in October were at least 110,000,000 lb., which compare with an average up to October of 70,000,000 to 80,000,000 lb. per month. Sales for October, as noted last week, were estimated at 140,000,000 lb., with production only 40,000,000 lb. per month. It is reported that certain interests in Japan are inquiring for 1000 tons of electrolytic copper.

Tin.—On only one day in the last week has there been any business of consequence. On Thursday, Nov. 10, at least 300 tons of Straits tin was sold, the business having been done late in the day. The demand consisted of actual spot delivery and future shipment and, of the total sold, at least two-thirds went direct to consumers. Previous to Thursday the market had been lifeless. On Saturday a little more business was done, but yesterday and to-day the market has been dull. Spot Straits tin, New York, is quoted to-day at 28.50c., New York. The tendency of prices has been upward, due largely to the rising value of the pound sterling. Arrivals thus far this month have been 1505 tons with 3475 tons reported afloat.

Lead.—The feature in the market is the announcement that on or about Dec. 10 a reduction in freight rates will go into effect, amounting to about 15 points; that is, the present rate of 49c. per 100 lb. will approximate 35c. per 100 lb. from East St. Louis to the seaboard, and enable Western producers to more easily compete in this market. Business has been exceedingly quiet, with a steady demand reported at prevailing prices, which are 4.70c., New York, or 4.35c. to 4.40c., St. Louis, in the outside market, with prices of the leading interest unchanged at 4.70c., both New York and St. Louis.

Zinc.—The market has turned quiet, due principally to two causes. One is the fact that consumers supplied themselves liberally in the buying movement in October, at which time producers sold their output fairly well ahead. There is also the factor of a probable freight reduction on zinc from the Mississippi River to seaboard points for practically the same amount as in the case of lead, referred to in the preceding paragraph. Both of these conditions would tend to influence buyers to hold back. As the year approaches the end there is also the tendency to limit stocks for inventory purposes. We quote prime Western for early delivery at a minimum of 4.72½c., St. Louis, or 5.22½c., New York, with most producers asking 4.75c., St. Louis, or 5.25c., New York, if quoting at all.

Antimony.—The market is lower and exceedingly quiet at 4.65c., New York, duty paid, for wholesale lots for early delivery.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 24.50c. by the leading interest, f.o.b. plant, but it is probable that this seller would meet the quotations for the same grade as sold by importers at 17c. to 18c., New York, duty paid.

Old Metals.—Demand is better and prices are firm. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	$12.25
Copper, heavy and wire	11.25
Copper, light and bottoms	9.50
Heavy machine composition	9.50
Brass, heavy	7.00
Brass, light	5.50
No. 1 red brass or composition turnings	7.75
No. 1 yellow rod brass turnings	5.75
Lead, heavy	4.25
Lead, tea	3.25
Zinc	3.00

Chicago

Nov. 15.—Tin has advanced and zinc has declined, while other prices are unchanged. Inquiry for copper is light but prices are firmly held. There has been more activity in tin and prices have fluctuated from day to day, receding the latter part of last week and then recovering again. Lead is stagnant and weak. There has been considerable inquiry for zinc, but big buying is held up in anticipation of lower prices. We quote in carload lots: Lake copper, 13.25c. to 13.50c.; tin, 30.00c. to 30.50c.; lead, 4.45c.; spelter, 4.75c.; antimony, 7c., in less than carload lots. On old metals we quote: Copper wire, crucible shapes and copper clips, 8.50c.; copper bottoms, 7c.; red brass, 7c.; yellow brass, 5c.; lead pipe, 3c.; zinc, 2.25c.; pewter, No. 1, 17c.; tin foil, 18c.; block tin, 20c.; all buying prices for less than carload lots.

St. Louis

ST. LOUIS, Nov. 15.—Lead is easier at from 4.35c. to 4.45c., car lots, while slab zinc is more steady at from 4.65c. to 4.75c., and up 5c. to 10c. for the week. In old metals we quote: Light brass, 3.50c.; heavy red brass, 7c.; light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; pewter, 15c.; tinfoil, 16c.; tea lead, 2c.; aluminum, 9c.

Campaign for Greater Use of Tin Plate

American manufacturers of tin plate, in the near future, will inaugurate a country-wide publicity campaign designed to enlarge the uses of their product. The opening wedge will be driven in an effort to induce the use of tin plate for containers for candy, coffee and tobacco, including cigars and cigarettes, in place of paper and cardboard. Apparently there is a large field for tin plate in candy containers, as a recent canvass disclosed an annual per capita consumption in this country of 12 lb. It also has been uncovered lately that coffee wholesalers have started a move seeking to have retailers, who do not distribute ground coffee in airtight containers, to grind the coffee upon sale, as it has been discovered that much of the aroma and strength leaves ground coffee between the time of packing and consumption when the container is of paper or some equally porous material. The superiority of tin boxes over paper or cardboard packages in keeping tobacco fresh has been so thoroughly demonstrated as to encourage the belief that for cigarettes and cigars there is a big field for tin contianers.

Work will commence on the oil refinery at Dishman, Wash., to be built by the Consolidated Diamond Oil & Refining Co., according to announcements of the company at Spokane headquarters. The refinery is designed to handle 500 bbl. per day.

PERSONAL

Daniel M. Clemson, one of the junior partners of Andrew Carnegie and for more than 40 years affiliated with Carnegie enterprises, recently announced his retirement from active business and plans to devote the remainder of his life to travel and leisure, free from the restrictions of business. He became identified with the Carnegie interests Jan. 1, 1880, as a mechanic at the Scotia ore mines of the company near Bellefonte, Pa. Later he was made superintendent of these mines. In 1887 he was promoted to the position of general manager of the Carnegie Natural Gas Co., the natural gas subsidiary of the Carnegie Steel Co., and about 20 years ago was elevated to its presidency. He was a director of the Carnegie Steel Co. as well as of its predecessor, the Carnegie Brothers Co., besides serving as an official of a number of the underlying Carnegie Steel Co. companies. Mr. Clemson has always evinced a keen interest in Pittsburgh charitable and philanthropic institutions, being especially active in the affairs of the Pittsburgh Association for the Improvement of the Poor.

J. M. Dillon, New England representative of the Detroit Twist Drill Co., has been promoted to district manager with an office at 45 Warren Street, New York.

Maj. Glen Edgerton, corps of engineers, has been appointed Director of Sales, War Department, succeeding Lt. Col. E. S. Hartshorn. For the past year and a half, Major Edgerton has been in charge of the sale and disposal of all surplus material of the corps of engineers.

H. V. Schiefer has been placed in charge of the Philadelphia office of the Webster Mfg. Co., Chicago. He has been affiliated with the C. O. Bartlett & Snow Co., Cleveland, as chief draftsman; Meese & Gottfried Co., San Francisco, as chief engineer; the Grasselli Chemical Co., Cleveland, as labor saving engineer, and the Arthur G. McKee Co., Cleveland, as manager of sintering plant department. He has contributed freely to the technical press on the subjects of material handling and the sintering of blast furnace flue dust.

John D. Wise, since 1919 with the Osborn Mfg. Co., Cleveland, foundry molding machines, has been appointed superintendent of the foundry laboratory at the University of Illinois.

Edward Kopper, Jr., formerly assistant superintendent American Hoist & Derrick Co., St. Paul, has resigned to become a partner in the H. C. McNair Co., St. Paul, agent for manufacturers of steel and railroad supplies.

W. B. Montgomery, formerly staff service director C. E. Knoeppel & Co., New York, industrial engineers, has joined A. F. Stock as Montgomery & Stock, Rochester, N. Y., industrial engineers.

Russell J. Englehart has become assistant superintendent of the forge laboratory at the University of Illinois. Previously he was with the Winchester Repeating Arms Co., for which he made an investigation of the manufacturing and heat-treating of steel.

J. W. MacMorris has become factory manager of the Mercer Motors Co., Trenton, N. J.

H. W. Townsend, formerly district manager Aldrich Pump Co., Pittsburgh office, has become works manager at the main plant at Allentown, Pa.

Edward Ray Weidlein has been appointed director of the Mellon Institute of Industrial Research by the chancellor and trustees of the University of Pittsburgh.

Fred W. Krebs, sales manager at Cleveland for the United Alloy Steel Corporation, Canton, Ohio, has been moved to the home office as sales promotion engineer. He has been succeeded at Cleveland by W. H. Forbes, formerly with the Cleveland office of the Carnegie Steel Co.

Leonard R. Nourie, Boston, Manning, Maxwell & Moore, Inc., has severed his connection with the company and has made no plans for the immediate future.

Bruce Barton, editor and writer, spoke on industrial relations building before the Greenfield Tap & Die Engineering Club, Greenfield, Mass., last week. During the evening motion pictures of the new G. T. D.-Morgan Hydroil grinder were shown.

Eliot K. Burr, Skinner Chuck Co., New Britain, Conn., has been made chairman of the New Britain Chamber of Commerce traffic bureau and also third vice-president of that organization.

George E. Quinn, Hartford, Conn., has puchased from Frank I. Hall and H. H. Hall the capital stock of the Draper & Hall Co., Middletown, Conn., tools and dies. The plant is located on Hubbard Street, being established there about 15 years ago.

H. C. Blake, secretary and general manager Foos Gas Engine Co., Springfield, Ohio, has been elected president in place of S. E. Baker, deceased. M. E. Baker has been elected secretary and treasurer.

John L. S. Birkinbine, Birkinbine Engineering Co., Philadelphia, has been made general manager of the Southern Coal & Iron Corporation and will assume the management of its iron properties at Rittenhouse Gap, Pa., and Roanoke, Va.

John Kirby, second vice-president and general superintendent of the William B. Pollock Co., fabricating interest of Youngstown, Ohio, was tendered a reception Nov. 12 by associates upon the completion of 50 years of service with the company. Mr. Kirby started to work for the Pollock company as a rivet heater when 16 years of age. He was presented with a huge loving cup and a 12-volume set of Spanish literature.

H. M. Witters has resigned as manager of the Milwaukee branch of the E. J. Woodison Co., Detroit, to become sales manager of the Western Malleables Co., Beaver Dam, Wis. His son, Charles H. Witters, has been promoted from assistant manager to manager of the Woodison offices in Milwaukee.

Leland F. Goodspeed, formerly chief engineer Barley Motor Car Co., Kalamazoo, Mich., has joined the Commonwealth Motors Co., Joliet, Ill., as vice-president in charge of engineering.

L. Kattenberg, a director of Handelmaatschappij R. S. Stokvis & Zonen, Rotterdam, sailed for Europe on the Olympic Nov. 15. Mr. Kattenberg, who interests himself in sales of iron and steel products for his company, made his trip to the United States to conclude transactions with American mills, which he says are able to hold their own with Germany in certain steel products. While in the United States his headquarters were with R. S. Stokvis & Sons, 17 Battery Place, New York.

Dr. Colin G. Fink, consulting electro-metallurgist, has removed his office to 101 Park Avenue, New York.

Waldo L. Phillips, F. R. Phillips & Sons Co., Pennsylvania Building, Philadelphia, steel exporter, will sail from San Francisco Dec. 5 on a business trip around the world. He will visit Japan, China, Italy, England and other countries, returning in about four months.

OBITUARY

THOMAS SMYTH FAUNTLEROY, president Moline Malleable Iron Co., St. Charles, Ill., died Nov. 9, at the Presbyterian Hospital, Chicago, and was buried on Nov. 11 at his home in Geneva, Ill. Mr. Fauntleroy had been president of the Moline Malleable Iron Co. since 1905, when he left the Ewart Mfg. Co., of which he was secretary and treasurer for 26 years. He was 77 years of age.

JOHN MAGEE, Magee Furnace Co., Union Street, Boston, died Nov. 7, at his home in Grafton, Mass., in his 74th year. He retired from active business about 10 years ago.

Machinery Markets and News of the Works

BETTER BUYING

Railroads, Automobile Manufacturers and Schools Provide Business

Durant Motors, Inc., Acquires 30 Turret Lathes and Other Shop Equipment

Though machine-tool buying continues at low ebb, there is a decided improvement this month, orders coming from several different sources, principally the railroads, public schools, automobile manufacturers and the brass industry.

Two new automobile companies, Durant Motors, Inc., and the Rickenbacker Automobile Corporation, both of Detroit, have made purchases. Durant Motors, Inc., bought 30 turret lathes and other new and slightly used tools, while the Rickenbacker Corporation acquired several miscellaneous tools.

Railroad buying has been confined to small lots. The Virginian Railroad, which took 10 tools, was the largest purchaser. The Union Railroad, Pittsburgh, a subsidiary of the United States Steel Corporation, has bought a radial drill, lathe and planer. The New York Central has purchased two lathes from Government stocks at Hog Island, Philadelphia. The Santa Fe, Rock Island and the Illinois Central have also bought in a small way.

The Missouri, Kansas & Texas, the Delaware, Lackawanna & Western and the Erie railroads have not yet purchased against their recent lists, but the M. K. & T. is expected to reach some decision within a week. The Erie will probably buy slightly used tools whenever such will meet their requirements.

Among current inquiries are the following: Three lathes for the Commonwealth Edison Co., Chicago, two lathes for the Ford Motor Co., Detroit, and two 42-in. heavy-duty lathes for the American Steel & Wire Co., Cleveland, the latter being a revived inquiry.

Three heavy-duty lathes have been sold by a Cincinnati builder for shipment to South America.

The Manchester, N. H., public schools have closed for nine metalworking tools, together with woodworking machines, electric and gas furnace equipment, etc.

A turret lathe manufacturer reports that the first two weeks of November brought the best business of the year, the brass industry being conspicuous as a buyer.

New York

NEW YORK, Nov. 15.

A little railroad activity continues to feature current buying of machine tools. The Union Railroad of Pittsburgh, a subsidiary of the United States Steel Corporation, has placed with a New York company an order for three large machines, a 6-ft. radial drill, 42-in. x 20-ft. lathe, and a 60-in. planer. The New York Central has bought a 24-in. and an 18-in. lathe from Government stocks at Hog Island, Philadelphia. No orders have yet been placed by the Delaware, Lackawanna & Western and the Erie railroads. The Erie, whose list was published a week ago, will probably purchase used tools.

Orders for single machines are somewhat more frequent. It is the smaller companies that are placing such business. Most of the larger users of metal-working tools have more shop equipment than they need for the present volume of business.

During the past week there have been a few purchases of electric cranes and a few new inquiries. Buying in this field, however, is still almost entirely a question of price. The Ferguson-Allan Co., 504 Bailey Avenue, Buffalo, N. Y., has requested offers of a second-hand or new crane of from 3-ton to 5-ton capacity, 40-ft. x 50-ft. span, either hand power or electric. William Steel & Sons Co., Philadelphia, which has been handling the purchase of four electric cranes for Horace T. Potts, Philadelphia, announces that purchase has been postponed until next spring. The Textile Finishing Machinery Co., Providence, R. I., which recently inquired for four electric and three hand power cranes, all of 5-tons capacity, has reached a decision on the bids submitted. The Booth Brothers & Hurricane Granite Co., 206 Broadway, New York, is receiving bids on a 15-ton, eight-wheel locomotive crane. The John W. Ferguson Co., United Bank Building, Paterson, N. J., recently in the market for a 10-ton crane, has purchased second-hand.

Among recent sales are: Niles-Bement-Pond Co., 10-ton overhead traveling crane to the Merchants Despatch & Navigation Co., Buffalo, 5-ton, 47-ft. span overhead traveling crane to the Wheeler Condenser & Engineering Co., Carteret, N. J.; 5-ton, 60-ft. span overhead traveling crane to the Simbroco Stone Co., Boston, and a 50-ton, 38-ft. span overhead traveling crane to the Hudson Coal Co., 26 Liberty Street, New York; Brown Hoisting Machinery Co., a No. 2, type B, 5-ton electric locomotive crane to the city of New Haven, Conn.

The Loening Aeronautical Engineering Co., 351 West Fifty-second Street, New York, has leased property, 99 x 130 ft., on East Thirty-first Street, as a site for a new plant to manufacture aeroplanes, flying boats, parts, etc.

The O. J. Bloss Iron Works, 253 Monitor Street, Brooklyn, has completed plans for a new one-story iron-working building, 30 x 100 ft., on Henry Street. Charles A. P. Jehle, 350 Fulton Street, Brooklyn, is architect.

The Tiffany Electric Co., Inc., 165 Broadway, New York, manufacturer of electrical machinery and parts, is arranging a list of equipment for installation at its two-story machine shop, 40 x 150 ft., on Howell Street, Jersey City, N. J., now in course of erection, to include a wet grinder, radio drilling machine, etc.

The International Cement Co., 1834 Broadway, New York, has awarded contract to the Turner Construction Co., 244 Madison Avenue, for a new one-story building at its plant at Hudson, N. Y., 160 x 600 ft., estimated to cost about $200,000.

The Martin-Perry Co., 560 Jackson Avenue, Long Island City, manufacturer of automobile bodies, with headquarters at York, Pa., has had plans prepared for extensions and improvements in the building at Lincoln Highway and the Passaic River, Kearny, N. J., recently leased for a new branch plant, to cost about $50,000. The factory will be two stories, 50 x 100 ft. R. M. Barrett is in charge.

The Erie Railroad Co., 30 Church Street, New York, will soon call for bids for a one-story shop addition, 70 x 200 ft., at its yards at Hornell, N. Y., and estimated to cost about $100,000, with equipment. M. G. King, company address, is architect.

The Board of Education, Park Avenue and Fifty-ninth Street, New York, has leased four floors in the building now being erected at Concord and Duffield streets, Brooklyn, for the Manual Training School Department. It will be equipped for machine, mechanical, electrical and other affiliated branches of instruction.

The Emergency Fleet Corporation, Washington, has issued call for bids until Dec. 29 for proposed repairs to the steamship Leviathan. The work is estimated to cost about $5,000,000, including machinery, and specifications for the latter, temporarily held up, have now been completed. New power plant, oil-burning apparatus and other equipment will be required. The International Mercantile Marine Co., 9 Broadway, New York, is acting as agent and plans are on file at this office.

Electric motors, shafting, transmission and other mechanical equipment will be installed in the two-story and basement, reinforced-concrete laundry, 100 x 100 ft., to be erected at Fifth Avenue and 141st Street, New York, by the National Family Laundry Corporation, 1471 Wilkins Avenue, estimated to cost about $400,000, with machinery. The J. J. Gloster Co., 110 West Fortieth Street, is architect.

The Hub Electrical Supply Co., 558 Melrose Avenue, New York, manufacturer of electrical specialties, has acquired the three-story building at 616 Courtland Avenue, on site 25 x 100 ft., for new works. Alterations and improvements will be made at once. Joseph Newman is president.

The Studebaker Corporation of America, 1700 Broadway, New York, has leased the one-story building occupying the block front on Gerard Avenue, between 149th and 150th streets, for a new service and repair works for Studebaker automobiles.

A portion of the addition to be erected by the Royal Metal Furniture Co., 125 Eighth Street, Brooklyn, 70 x 75 ft., will be equipped as a foundry and the remainder for general manufacture. Work will be placed under way at once.

The Ward Baking Co., Southern Boulevard and St. Mary's Street, New York, has leased the two-story building at Southern Boulevard and 137th Street, recently completed, for a new service works, with repair department, for company automobiles.

The Warner-Quinlan Co., 79 Wall Street, New York, has commissioned George Gifford, engineer, 227 Fulton Street, to prepare plans for rebuilding its asphalt manufacturing plant at Linden, N. J., destroyed by fire last July with loss estimated at $3,000,000. The new works, it is said, will cost close to a like amount. W. W. McFarland is general manager.

The Lehigh Valley Railroad Co., Jersey City, N. J., has filed plans for a new shop and mechanical building at its car and locomotive shops at the foot of Chapel Avenue, to cost about $150,000.

The M. W. Kellogg Co., Jersey City, N. J., manufacturer of power plant equipment, steam specialties, etc., has removed a portion of its plant from West Side Avenue to the new buildings now completed in the Droyers' Point section. Work on other buildings will be pushed to completion, and it is proposed to have the entire plant completed and occupied early in the spring.

The Globe Tile Co., 865-71 Grand Street, Brooklyn, will commence the immediate erection of its new plant on Grand Street, 100 x 100 ft. It will be equipped with marble and stone-working machinery, and an electric traveling crane for yard and shop service will be installed. Harry L. Morton is manager.

A new power plant of about 1000-kw. capacity will be constructed by the Daniels Linseed Oil Co., 20 Ninth Avenue, Minneapolis, Minn., in connection with its new plant at Edgewater, N. J. Contract for the erection of a number of buildings has been awarded to the Tilt-Hargan Co., 90 West Broadway, New York, including main building, 150 x 250 ft. Samuel Mairs is secretary.

Fire, Nov. 8, destroyed the two-story plant of C. C. Galbraith & Son, Keyport, N. J., manufacturer of marine equipment, lifeboats, rafts, etc., with loss estimated at about $50,000, including equipment.

The Burroughs Machinery Corporation, 246 North Tenth Street, Newark, N. J., has acquired the property and business of the Charles Burroughs Co., for many years engaged in the manufacture of machinery at 141-49 Commerce Street. The company some time ago disposed of its factory site to the city and operations in the future will be conducted at the North Tenth Street works.

The Board of Freeholders, Court House, Newark, is planning for the installation of a new coal conveyor system for the power house at the Essex Mountain Sanatorium, Verona. Frederick O. Runyon, Runyon & Carey, 843 Broad Street, engineers, is in charge.

The Sun Machinery Co., 103 Commerce Street, Newark, has acquired property at 28 Mechanic Street and on Green Street and will remove its works to these locations.

Hoisting machinery, conveying and other mechanical equipment will be installed at the new terminal plant to be established by the William F. Shupe Co., 85 Day Street, Orange, N. J., builders' materials, on the former Government property at Kearny, N. J. The company has leased 30 acres with 1500 ft. of dock frontage on the Passaic River, improved with four buildings, each containing about 50,000 sq. ft. The project is said to involve about $2,000,000. The Shupe Terminal Corporation has been organized with a capital of $2,500,000, as a subsidiary organization, to carry out the details of the new plant and provide for operations.

Chicago

CHICAGO, Nov. 14.

The market situation has changed little except in sentiment, which is generally more cheerful. Inquiries are still few, but are more often followed by purchases than has been the case heretofore. Railroads with headquarters in Chicago are still disposed to postpone action on their outstanding lists, although they have placed orders for a few machines the past week. The Santa Fe bought an axle lathe, a 1500-lb. steam hammer, and two sheet metal-working machines for 14-gage material. This road, however, proposes to send out new inquiries covering the remaining machine tools on which it has previously secured quotations. The Illinois Central bought a 25-in. shaper, and the Rock Island has placed an order for a wet grinding machine. Joseph T. Ryerson & Son, Chicago, recently received an order from the Virginian Railway for about $20,000 worth of equipment, including two radial drills and a half dozen engine lathes. Word comes from St. Louis that the Missouri, Kansas & Texas has not yet bought against its pending list, but will probably take action this week. Perhaps the largest order received by a local dealer from a Chicago industrial user comprises a 24-in. x 10-ft. engine lathe, a 24-in. drill press, and a 24-in. shaper.

Crane activity is at a low ebb. Among the few orders recently placed, was one for a 5-ton 70-ft. electric overhead traveling crane, received by the Whiting Corporation, from the Indiana Fibre Products Co., Marion, Ind. The Whiting Corporation also will furnish 18 100-ton locomotive trucks to the Santa Fe, and has received an order from another Western road for a turntable tractor.

The Commonwealth Edison Co., Chicago, is in the market for three engine lathes.

The Troy Laundry Machine Co. will abandon its five-story plant, which covers an entire block on south LaSalle Street, between Twenty-second and Twenty-third streets, Chicago, and will move to the 83-acre plant of the Root & Vandervoort Engineering Co., which it has purchased at East Moline, Ill. The latter property comprises 20 buildings with 600,000 sq. ft. of floor space.

A one and two-story factory, 93 x 185 ft., 2065-71 Powell Avenue, Chicago, is now being constructed for the manufacture of golf balls. The plant, which will cost $45,000, will be occupied by Thomas E. Wilson & Co., sporting goods manufacturer.

The Duty Motors Corporation has let contract for the construction of a plant in Raymond Street, Elgin, Ill., to cost $15,000.

The Lincoln Water & Light Co., Lincoln, Ill., is remodeling a storehouse, east and north of its main building, into a machine shop. The machine shop was formerly located in the main structure.

The capacity of the Standard Brake Shoe & Foundry Co. plant at Pine Bluff, Ark., is to be doubled to take care of increasing business, according to F. L. Dilley, head of the company. The present capacity is 800,000 lb. of finished products per month. The contemplated improvement will cost about $20,000.

The Mechanical Devices Co., 134 Fox Street, Aurora, Ill., has been incorporated with $25,000 capital stock to manufacture oil-less peg bearings, barrel pumps and house service pumps. Its machinery requirements have been satisfied for the time being. The officers are: President, F. E. Sperry; vice-president, C. H. Greene; secretary and treasurer, C. S. Battles.

The Star-Buck Corporation, 1205 Lehmann Building, Peoria, Ill., recently incorporated with $35,000 capital stock, will not engage in the manufacturing business, but will confine itself to the merchandising of toys, novelties, and machinery.

The Weaver Auto Douser Co., 14 East Jackson Boulevard, Chicago, recently incorporated with $15,000 capital stock to manufacture automatic devices for the control of the operation of motion picture projection machines, is having its products made in a leased plant at Watts, Cal.

The Omaha Semi-Steel Foundry Co., 1409 Jackson Street, Omaha, Neb., has completed plans for a one and two-story plant, 60 x 100 ft. W. F. Gernandt, 701 O. L. & B. Association Building, is architect.

The Bogner Automobile Co., McHenry, Ill., has plans under way for a new two-story service and repair building, estimated to cost close to $50,000. H. B. Cox, Lehmann Building, Peoria, Ill., is architect.

The Carney Cement Co., Carney Station, Mankato, Minn., will hold in temporary abeyance the erection of eight new buildings at its plant. Foundation work for a number of the structures has been completed and plans for the superstructures prepared. R. K. Meade, 13 East Fayette Street, Baltimore, is engineer.

The Artificial Ice Co., Oskaloosa, Iowa, has completed plans and will commence the immediate erection of a new one-story ice-manufacturing factory to cost about $40,000. R. T. Panders is manager.

Conveying machinery, power equipment and other mechanical apparatus will be installed in the new one-story plant, 75 x 350 ft., to be erected by the Northern Illinois Cereal Co., Lockport, Ill., estimated to cost about $100,000, including machinery. C. W. Webster, Cutting Building, Joliet, Ill., is architect.

The State Board of Regents, T. W. Dwight, president, Pierre, S. D., has completed plans for a new power house for the State College of Agricultural and Mechanical Arts, Brookings, S. D. H. F. Berg, Pierre, is State engineer.

The Creamery Package Mfg. Co., Fort Atkinson, Wis., manufacturer of dairy and farm machinery, is having plans prepared for a new three-story building on Colfax Avenue, St. Paul, Minn., 95 x 170 ft., estimated to cost about $100,000. Headquarters of the company are at 61 West Kinzie Street, Chicago.

New England

BOSTON, Nov. 14.

Practically all local machine tool houses were closed from Thursday evening until to-day, which is reflected in the volume of business transacted the past week. The most important order placed was 14 metal-working machines and considerable wood-working equipment by the city of Manchester, N. H., for its schools. The Practical Arts High School list included one 20-in. drill, one Sipp sensitive drill, one universal milling machine, one 14-in. x 10-ft. lathe, one 11-ft. x 5-ft. speed lathe, one 12-in. x 6-ft. lathe, one No. 190 Wells cutter and reamer grinder, one 16-in. Hendey shaper, and one 16-in. x 5-ft. lathe, together with electric, gas furnace and miscellaneous wood-working equipment, including seven 11-in. x 4-ft., two 11-in. x 5-ft. and one 13-in. x 6-ft. lathes. The list for the West Side High School included one 20-in. drill, one 14-in. x 8-ft. lathe, one 11-in x 5-ft. speed lathe, one double head grinder and one 9-in. x 5-ft. lathe, with wood-working equipment including five 11-in. x 4-ft. and one 13-in. x 6-ft. lathes. All tools are motor driven, guaranteed against price and are to be delivered in May, 1922. The full list of equipment has not been purchased.

Other sales the past week include the following used equipment to a manufacturer of textile machinery: One 18-in. x 8-ft. lathe, one 21-in. drill, one speed lathe, and one universal grinding machine. A large manufacturer of electrical appliances bought a new multiple spindle drill, 24 spindles, for local delivery, while a Salem manufacturer closed on a new four-spindle drill. The American Woolen Co. threw out all bids on its prospective crane order and asked builders to submit bids on new specifications.

The Stark Tool Co., Waltham, Mass., precision lathes, has issued a new price list which shows reductions on some numbers only. Compared with ten months ago the company's line averages 32 per cent lower. Some makers of snap gages have reduced prices approximately 12½ per cent.

Among recent sales in Connecticut is that by Peck, Stow & Wilcox Co. of shears, rollers, bending machines, cornice brakes and drills to the Griswold, Richmond & Glock Co., sheet metal, 135 Cheldon Street, Hartford, where it occupies the first floor, 25 x 235 ft., formerly occupied by the Connecticut Blower Co.

The Burton-Furber Coal Co., 50 Congress Street, Boston, will erect a one-story garage and repair shop, 30 x 50 ft., at 161 Medford Street, Charlestown.

Ernest Kiesel, 25 Oliver Street, Stamford, Conn., is having plans revised for a three-story, 50 x 114-ft. garage and light manufacturing building.

Contract has been awarded by the Textile Finishing Machinery Co., Providence, R. I., for a two-story, 60 x 90-ft. machine shop and office.

The Mack Motor Truck Co., 185 Massachusetts Avenue, Cambridge, Mass., will erect a one-story, 44 x 110-ft. addition to its plant on Osborn Street.

The Builders' Iron & Steel Co., 262 Bridge Street, East Cambridge, Mass., will erect a one and one-half-story, 70 x 200-ft. manufacturing plant on Garvey Street, Everett, to cost about $65,000.

During the past week about 15 cars of equipment were unloaded at the new Meriden, Conn., plant of the New Departure Mfg. Co., Bristol, Conn., ball bearings, etc. No definite time has been set for opening the plant.

The Hampden Motor Truck Corporation, Holyoke, Mass., a $1,000,000 company granted a charter about a month ago, has purchased eight acres on McKinstry Avenue, Chicopee, Mass., on which it will erect the first unit of a manufacturing plant in the near future.

The Crane Co., Bridgeport, Conn., manufacturer of steam specialties, valves, piping, etc., has completed plans for a one-story addition to its plant on South Avenue, 75 x 175 ft., to be used for the most part for annealing operations. Headquarters of the company are at 836 South Michigan Avenue, Chicago.

The Connecticut Light & Power Co., Waterbury, Conn., is disposing of a stock issue of $4,000,000, the proceeds to be used for extensions and improvements. A hydroelectric generating plant is now being operated at Stevenson, on the Housatonic River, and a steam-operated plant at Waterbury. Irvin W. Day is vice-president.

The Southbridge Foundry Co., Southbridge, Mass., has awarded contract to the Truscon Steel Co., Youngstown, Ohio, for a new one-story foundry, 50 x 100 ft. Work will commence at once.

The plant and business of the Draper & Hall Co., Middletown, Conn., manufacturer of tools, dies, etc., has been acquired by George E. Quinn, Hartford, Conn., and the business will be continued in the building on Hubbard Street, as heretofore. Frank I. and H. H. Hall retire from the company, having disposed of their interests.

The Stafford Co., Hyde Park Avenue, Boston, manufacturer of weaving machinery and mechanisms, has arranged for a preferred stock issue, the proceeds to be used for general operations, expansion, etc.

The Cambridge Electric Light Co., 46 Blackstone Street, Cambridge, Mass., is having plans prepared for a new one-story power house, 80 x 180 ft. French & Hubbard, 210 South Street, Boston, are engineers.

The Eagle Construction Co., Bridgeport, Conn., has plans under way for a one-story, brick addition, 45 x 91 ft., to its metal and wood-working plant. Harry E. Koerner, Bridgeport, is architect.

An automobile service and repair building, three stories, 40 x 100 ft., for company cars, will be erected by Walter Baker & Co., Ltd., Pierce Square, Dorchester, Mass., at Lower Mills, to cost about $45,000.

Philadelphia

PHILADELPHIA, Nov. 14.

William A. Loveland, Inc., 2014 Sansom Street, Philadelphia, electrical construction and contracting, has leased the two-story building at 2025 Sansom Street, for a new works. Possession will be taken at once.

The Producers' Cold Storage Terminal, Inc., Philadelphia, care of Andrew J. Sauer & Co., Denkla Building, engineers, is having plans prepared for a 10-story ice and cold storage plant at Swanson and Water streets, 90 x 275 ft., estimated to cost about $1,500,000, with machinery.

The Paramount Electric Supply & Fixture Co., Philadelphia, has leased the building at 251 Market Street, for a new works. Possession will be taken at once.

The Department of Public Works, Bureau of Highways, City Hall, Philadelphia, is completing plans and will soon commence the erection of a new one-story machine shop, 56 x 120 ft., at Thirtieth and Spring Garden streets, in connection with an automobile service building, 80 x 105 ft., for municipal cars.

The Franklinville Ice Storage Co., 3423 North Sixth Street, Philadelphia, will make extensions and improvements in its plant at 5166-70 Jefferson Street, including the installation of refrigerating equipment, to cost about $40,000.

The Emergency Fleet Corporation, Washington, has perfected arrangements for the liquidation of its holdings at the Pusey & Jones shipyard, Gloucester City, N. J., and will dispose of all surplus equipment and supplies now at the yard.

The Nottingham Rubber Co., Trenton, N. J., recently organized with a capital of $500,000, is planning the erection of works near Philadelphia to manufacture automobile tires and tubes and other rubber products. Options are said to have been taken on a site. Samuel H. Bell, Reading, Pa., is president; I. Alexander, Trenton, secretary; and C. Francis Fisk, 150 East State Street, Trenton, vice-president and general manager. Details of the project will be handled by the latter.

The Spring City Glass Works, Spring City, Pa., has completed plans for a new machine shop, 25 x 50 ft., and will take bids at once. J. Vincent Poley, 162 Second Avenue, Royersford, Pa., is architect.

The Mifflinburg Body Co., Mifflinburg, Pa., manufacturer of automobile bodies, has awarded contract to Jacob Gehron & Son, 607 Cemetery Street, Williamsport, Pa., for a new two-story plant, 62 x 90 ft. J. C. Sterling heads the company. R. R. Markley, Spooner Building, Harrisburg, Pa., is architect.

The Harrisburg Stanley Spring Co., Harrisburg, Pa., will commence the immediate erection of a new plant to manufacture special self-oiling and boltless automobile springs. It is proposed to develop an initial output of about 1000 tons of material a year. Troy B. Wildermuth is president; William V. Davies, treasurer, and Harry D. Delmotte, secretary.

The Gray Iron Foundry Co., Reading Pa., will increase its line of production, to include axes, hatchets, hammers, tinners' tools and other hardware specialties. The company

will also increase manufacture in the line of kitchen products.

The Board of Directors, Marywood College, Scranton, Pa., has had plans prepared for the construction of a new one-story power house, 40 x 104 ft. John J. Hawley, Traders' Bank Building, is architect.

The Susquehanna Power Co., New York, headed by Francis T. Homer, 40 Wall Street, and associates, is said to have plans nearing completion for a number of hydro-electric generating plants along the Susquehanna River in Pennsylvania and Maryland. The initial plant will be established in the vicinity of Port Deposit, Md. The project is estimated to cost in excess of $10,000,000, including power plant equipment, transmission apparatus, etc.

The Scranton Electric Co., Scranton, Pa., has plans under way for extensions and improvements in its power plant and system to cost close to $1,000,000. The work will include an addition to the generating plant on North Washington Street, and the installation of a new 20,000 kw. turbo generator with auxiliary operating machinery.

The Ellwood City Forge Co., Ellwood City, Pa., has let contract for an addition to its plant to the Penn Bridge Co., Beaver Falls. It will be the same size as the present factory and will double the capacity. More than 100 additional men will be employed when it is completed.

The report that a 15-ton crane for the Shawmont pumping station, Philadelphia, has been awarded to the Niles-Bement-Pond Co. is incorrect. It was awarded to Alfred Box & Co., Philadelphia.

Baltimore

BALTIMORE, Nov. 14.

The Fowler & Farley Engineering Co., 2121 Oak Street, Baltimore, recently organized, has plans under way for a new machine shop, and is making inquiries for a number of machine tools. Claude Farley is president and E. A. Fowler vice-president.

Slaysman & Co., 810-11 Pratt Street, Baltimore, operating a machine works, are planning to rebuild the portion of their three-story plant destroyed by fire Nov. 10.

The West Virginia & Maryland Power Co., Tunnelton, W. Va., is negotiating for the purchase of the municipal electric light and power plant at Oakland, Md., recently completed at a cost of about $45,000. Upon acquisition, the new owner plans for extensions. The West Virginia company is also arranging for the construction of a central generating plant on the Cheat River, near Albrightsville, W. Va., for light and power service along the line of the Morgantown & Kingswood Railroad.

The Continental Garage & Service Co., Baltimore, care of L. Lawson Wagner, Union Trust Building, architect, recently organized, has plans under way for a new five-story automobile service building, with repair works, on a site at the John Hopkins University property. It is estimated to cost about $400,000, with equipment. J. Bacon Hyatt, former manager of the Mid-City Garage & Motor Supply Co., is president of the new company.

David E. Gunter, Frostburg, Md., has awarded contract to the Austin Co., Bulletin Building, Philadelphia, for a new one-story automobile service building and repair works, estimated to cost about $42,000. Work will commence at once.

Machinery at the plant of Musher & Co., Inc., East Fayette and Eleventh streets, Highlandtown, Baltimore, including buildings and site, will be offered for sale by the Baltimore Trust Co., trustee, on Nov. 21. The plant has been used for the manufacture of oil products, and the equipment comprises grinding machines, air compressors, motors, pumping machinery, steel glass-lined tanks, as well as patents covering the manufacture of special package-filling and soldering machines.

The Nash Motor Co., Oliver and Maryland streets, Baltimore, has completed plans for a new three-story automobile service and repair building, and will commence work at an early date. Owens & Sisco, 1605 Continental Building, are architects.

The Musselman Concrete Pipe Co., Inc., New Holland, Pa., will break ground at once for the first unit of its proposed plant at Claymont and Thirteenth streets, Wilmington, Del. It will be 30 x 80 ft. and will be supplemented by two additional units early in the spring.

The J. G. Tice Co., La Grange, Ga., has acquired a site for a new foundry and machine shop. Plans are under way for a building 75 x 175 ft. and work will commence at an early date.

The American Furniture Co., Martinsville, Va., has had plans prepared for a new power house. Lockwood, Greene & Co., Charlotte, N. C., are architects.

The engine house and shop at New Market, Va., used by the Baltimore & Ohio Railroad, Baltimore, and the Southern Railway, Richmond, Va., was partially destroyed by fire Nov. 7 with loss estimated at about $20,000. It will be rebuilt.

The Common Council, Enfield, N. C., is having plans prepared for a municipal electric light and power plant, estimated to cost close to $50,000. William C. Olsen, Kinston, N. C., is consulting engineer.

The Houston Mfg. Co., Thirtieth Street, Columbus, Ga., manufacturer of machinery and parts, will install new equipment at its plant, including a lathe and other machine tools.

Cleveland

CLEVELAND, Nov. 14.

A local builder of turret lathes reports a better volume of orders the first two weeks of November than during the corresponding period for the past 15 months. The demand was largely from the brass industry and was mostly in single machine orders. Dealers generally report a slight improvement in business. Orders are still almost wholly for single machines and are coming from small shops. A Cleveland maker has taken two turret lathes for the Long Island plant of Durant Motors, Inc.

Inquiries are somewhat more plentiful. Some manufacturers in metal working lines are lining up equipment that they will eventually need but are withholding orders until their business picks up. The American Steel & Wire Co. has revived an inquiry for two 42-in. heavy-duty lathes. An Illinois maker of vertical milling machines has made a slight price reduction on part of his line.

The C. & G. Cooper Co., Mount Vernon, Ohio, has moved its gas producer plant from Marion, Ohio, to Mount Vernon. Several years ago it acquired the plant of the Marion Tool & Die Works in which it has been making gas producers, with the exception of the castings, which have been made at Mount Vernon.

The New Delphos Mfg. Co., in which Lima and Delphos, Ohio, men are interested, has taken over the plant of the Delphos Mfg. Co., maker of sheet metal products. A. W. Wheatley, president the Wheatley Co., Lima, and others are interested in the new organization.

The P. R. Morren Foundry Co., 4260 East Ninety-eighth Street, Cleveland, has had plans prepared for a foundry, 40 x 102 ft., and pattern shop.

The Canton Brick & Fireproofing Co., Midvale, Ohio, will shortly begin the erection of a new plant.

The Youngstown Welding Co., Youngstown, Ohio, has purchased 3½ acres on which it contemplates the erection of a new plant early next year, comprising three buildings, 100 x 298-ft. each.

The Pressed Metal Mfg. Co., Waukesha, Wis., plans to move to Lima, Ohio. It will manufacture shock absorbers for automobiles.

The Lewis Electric Co., Minerva, Ohio, manufacturer of electrical equipment, has awarded contract to the Boldt Construction Co., 5902 Euclid Avenue, Cleveland, for the first unit of its new plant, one-story, 90 x 200 ft. J. C. Lewis is president.

The Continental Clay Co., Zinninger Building, Canton, Ohio, has plans under way for a new one-story factory, 100 x 100 ft., at East Canton, for the manufacture of sewer pipe, etc. It is estimated to cost in excess of $200,000.

The Sands Mfg. Co., 5407 Sweeney Avenue, Cleveland, Ohio, manufacturer of water heaters, heating apparatus, etc., is preparing plans for a new one-story forge shop, 35 x 100 ft., estimated to cost about $40,000. J. M. Sands is head.

Pittsburgh

PITTSBURGH, Nov. 14.

Actual machine tool business still is of small proportions, but in the prospective the market shows considerable activity, with numerous requests for preliminary price information. One crane company representative reports four such inquiries the past week, while another is figuring against inquiries involving seven cranes. This also is the case with dealers in machine tools, whose chief activities are in quoting rather than in selling. The most lively tool prospects before the trade are those for the Western Penitentiary and the West Penn Power Co. The former inquiry has been revised for the second time and now specifies for first quality tools. The Merchants Dispatch & Transportation Co. recently closed for three 10-ton Niles cranes through the Rochester, N. Y., office of the Niles-Bement-Pond Co. Indications are that

The four cranes required by the Standard Underground Cable Co. will not be placed until after Jan. 1.

The Ward Baking Co., Pittsburgh, has filed plans for a new one-story automobile service and repair building estimated to cost about $50,000.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, will soon take bids for a one-story addition to its plant at Sixth and A streets, Louisville, 50 x 400 ft., to be equipped as an enameling works. It is estimated to cost about $75,000. O. P. Ward, Lincoln Building, Louisville, is architect.

The new plant of the Denk Engineering Co., 45 Shannon Building, Pittsburgh, plans for which are now being prepared, will be equipped for the manufacture of a general line of mechanical products. It was incorporated recently under Delaware laws with capital of $150,000, and is headed by F. J. Denk, A. H. Peabody and Leo J. Schaedle.

The Appalachian Power Co., Bluefield, W. Va., is having plans prepared for enlargements in its plant at Glen Lyn, to increase the capacity from 20,000 to 40,000-kw. New generating machinery, boilers and other equipment will be installed. Viele, Blackwell & Buck, 49 Wall Street, New York, are consulting engineers.

The United Mfg. & Equipment Co., Clarksburg, W. Va., is considering plans for a new one-story machine shop. H. H. DeMoss heads the company.

The Automotive Co., Oberlan Building, Charleston, W. Va., will hold in temporary abeyance the erection of its new one-story plant, 80 x 250 ft., at Mount Pleasant, W. Va., for the manufacture of automotive products. It is estimated to cost about $90,000, including machinery. Contract was awarded recently to the Rust Engineering Co., 1901 Fifth Avenue, Pittsburgh.

The Raleigh Wyoming Coal Co., Maben, W. Va., will build a new one-story power plant, 70 x 80 ft., at its local properties. The Rust Engineering Co., 1901 Fifth Avenue, Pittsburgh, is engineer.

Detroit

DETROIT, Nov. 14.

The Fisher Body Corporation, Durant Building, Detroit, manufacturer of automobile bodies, will break ground at once for a new two-story machine shop, 30 x 50 ft., on Farnsworth Avenue, to cost about $30,000. Austin & Howe, Book Building, are contractors. Fred J. Fisher is president.

The Marinette & Menominee Paper Co., Menominee, Mich., has arranged for a bond issue of $2,000,000, the proceeds to be used for general operations, extensions, improvements, etc.

The Ford Motor Co., Detroit, has preliminary plans under way for a number of additions to its plant. The work, it is said, will be carried out primarily to relieve the present unemployment situation in this section. Bids are being taken for an immediate extension to cost $200,000.

The Mac Sim Bar Paper Co., Otsego, Mich., will soon call for bids for its new one-story electric power plant, 85 x 140 ft., estimated to cost close to $300,000, including machinery. Billingham & Cobb, Press Building, Kalamazoo, Mich., are architects and engineers.

The Northrup Lock Co., Flint and Marshall streets, Orion, Mich., has completed plans and will commence the immediate erection of a new one-story factory. Charles Northrup is president.

The General Motors Corporation, Detroit, is arranging for the discontinuance of its Scripps-Booth passenger car division. It has been producing about 20 cars per day.

The Common Council, Sandusky, Mich., is arranging for the construction of a municipal electric light and power plant to cost about $45,000. L. C. Reid is city engineer.

The Stearns Lighting & Power Co., Ludington, Mich., is making plans to erect a new power unit and to remodel the present one and install new equipment.

The Page Steel & Wire Fence Co., Adrian, Mich., is making additions to its machinery equipment and enlarging its working force.

The Dry-Kold Refrigerator Co., Niles, Mich., is building an addition which will increase the floor space of the machine department 2000 sq. ft.

The property of the Hinkley Motors Corporation, Ecorse, Mich., was sold last week at public auction to Henry M. Butzel, Detroit, acting in behalf of unnamed clients. A new company will be organized which will begin production in a new plant to be erected at High and Cicotte streets, Ecorse.

The Jewett Phonograph Co., Allegan, Mich., has under construction an addition, 24 x 110 ft.

The Beach Mfg. Co., of Charlotte, Mich., is erecting a plant addition, one story, 30 x 150 ft.

The Michigan State Administrative Board has authorized the construction of a new power house on the site of a projected State reform school at Lansing, Mich., to cost $2,000,000. Preliminary work is under way.

The L. Perrigo Co., Allegan, is having plans prepared for a two-story brick and steel factory, 65 x 125 ft.

The Motor Wheel Corporation, Lansing, Mich., has awarded to the H. G. Christman Co. contract for a one-story building, 120 x 240 ft.

Buffalo

BUFFALO, Nov. 14.

The National Lamp Works of the General Electric Co., Nela Park, Cleveland, has preliminary plans under way for a new one-story power house at its Buffalo plant, 757 East Ferry Street, estimated to cost about $100,000. It is proposed to commence construction early in the spring. E. J. Edwards, company address, is engineer.

The Electro-Refractory Co., Ellicott Square Building, Buffalo, manufacturer of steel crucibles, etc., is planning to rebuild its works on Townline Road, East Hamburg, recently destroyed by fire with loss reported at $200,000. It will consist of a main plant, 50 x 300 ft., and machine shop, 30 x 75 ft.

Z. T. Darrow, Canandaigua, N. Y., is having plans prepared for a one-story machine shop, 80 x 100 ft. William S. Lozier, Cutler Building, Rochester, N. Y., is architect.

The Seneca Falls Foundry Co., Seneca Falls, N. Y., has leased the foundry of the Seneca Falls Mfg. Co., vicinity of Bridge and Water streets, and will occupy the structure for casting production.

The City Council, Buffalo, has adopted an ordinance requiring the electrification of all steam railroads entering the city after Jan. 1, 1923. The cost of the change, including equipment, is estimated in excess of $2,500,000. The different railroads affected include the New York Central; Delaware, Lackawanna & Western; Lehigh Valley; Erie; New York, Ontario & Western; Lake Shore & Michigan Southern; Michigan Central; West Shore; Wabash; and Buffalo, Rochester & Pittsburgh.

The New York State College of Agriculture, Cornell University, Ithaca, N. Y., has completed plans for a new cold storage plant. Lewis F. Pilcher, Capitol Building, Albany, N. Y., is State architect.

The Common Council, Gilbertsville, N. Y., has been granted permission to construct and operate a municipal electric light and power plant. Work will commence at an early date.

The Gulf States

BIRMINGHAM, Nov. 14.

The American Cotton Oil Co., New Orleans, is planning for the erection of new mechanical works, to be used primarily for car repair and parts manufacturing.

The National Forge Co., Anniston, Ala., has plans under way for rebuilding of the portion of its works recently destroyed by fire with loss estimated at $40,000.

Fire, Nov. 2, destroyed the plant of the Gulf Shingle & Ice Co., Mobile, Ala., with loss estimated at about $75,000, including ice and refrigerating equipment.

Crushing and pulverizing machinery, motors and other mechanical equipment will be installed in the new laboratory to be erected by the Florida Terminal Co., Fernandina, Fla. R. M. Martin is plant superintendent.

The Engineering Department, New Orleans, has completed plans for the installation of a new refrigerating plant in the municipal market on Poydras Street, to be about 21 tons capacity. W. Ball, City Hall, is city purchasing agent.

The Alexander Lumber Co., Alco, La., will commence the immediate erection of a new mill, to include hand saw department, 48-in. gang saw plant, circular saw and other departments. The machinery installation will provide for a daily output of 200,000 ft.

G. C. Holmes & Co., Houston, Tex., are negotiating with the Chamber of Commerce, Rockdale, Tex., for a site for the erection of a new oil refinery.

The Fort Payne Ice Co., Fort Payne, Ala., recently organized, has plans under way for a new one-story, ice-manufacturing plant. J. B. Harlson is president and G. A. Wetherley secretary-treasurer.

Freight-handling equipment, conveying machinery, etc., will be installed by the City Commission, Pensacola, Fla., in connection with the development of municipal terminal facilities in the Palafox wharf section. The work is estimated to cost about $200,000.

The Board of City Commissioners, Mobile, Ala., is con-

sidering the construction of a municipal ice-manufacturing and cold storage plant. Wright Smith, city engineer, is in charge.

Freight-handling machinery, cranes, etc., will be installed by the Louisville & Nashville Railroad Co., Louisville, in connection with its improvements and extensions at New Orleans and Gentilly, a suburb. The total expenditure to be made by the road in this district within the next six months will aggregate over $6,500,000.

Indiana

INDIANAPOLIS, Nov. 14.

The Alena Steam Products Co., Hume-Mansur Building, Indianapolis, recently organized, has acquired six acres on South Denny Street, fronting the Pennsylvania Railroad, as a site for a new plant to manufacture steam-driven motor trucks and tractors. The initial works will consist of a main one-story structure, with two wings, aggregating 60 x 250 ft. The main building will be equipped as an assembling plant and the wings as a sub-assembling department and machine shop, respectively. It will cost close to $50,000, including machinery. Fred Hamilton is president and John W. Cadle secretary and treasurer.

The Pendergast Fence Co., Stillwater, Mich., manufacturer of wire fencing, etc., has revised plans under way for its branch plant on Division Street, Elkhart, Ind., to be one-story and basement and estimated to cost about $25,000.

The Symplex Lock Rim Co., Petersburg, Ind., manufacturer of automotive equipment, is planning for enlargements in its factory and the installation of new machinery in different departments.

The Twentieth Century Garage Co., South Bend, Ind., is completing plans and will take bids at once for a one-story addition to its service and repair plant, estimated to cost about $50,000. Austin Shambleau, 111 North Lafayette Street, is architect.

The Lock Joint Tool Co., Mishawaka, Ind., has awarded contract to the Smoger Lumber Co., South Bend, Ind., for a new two-story factory on Engeline Street, South Bend, to cost about $30,000. Work has commenced.

Cincinnati

CINCINNATI, Nov. 14.

Some fair-sized orders were booked the past week, including about 10 tools for the Virginian Railway and three heavy duty lathes for export to South America. The new Rickenbacker Automobile Corporation, Detroit, was also a purchaser in this market, a local manufacturer having booked a number of miscellaneous machines. The Durant Motors, Detroit, bought some new machines and a large number of slightly used tools, including about 30 turret lathes. Orders for single machines are increasing and altogether a more hopeful feeling is evidenced. There are a few inquiries outstanding, including three lathes from the Commonwealth Edison Co. and two heavy-duty engine lathes from the Ford Motor Co. The Missouri, Kansas & Texas list is expected to be acted upon shortly, and a list is in preparation by one of the largest railroad systems in the country, which it is expected will be issued within a few weeks. Local dealers report sentiment greatly improved and an increased demand, particularly for used tools.

The Standard Bolt Corporation, Columbus, Ohio, incorporated under Delaware laws with a capitalization of $2,500,000 preferred stock and 25,000 share of no par common stock, has purchased the plant and property of the Standard Bolt Co., Columbus, Ohio. The plant will be operated as heretofore and changes and extensions will be made in several departments when business justifies it. J. C. Burns, formerly vice-president and general manager Standard Bolt Co., is president and general manager of the new corporation.

The Springfield Motor Sweeper Co., Springfield, Ohio, has been incorporated with a capitalization of $100,000 to manufacture a motor-driven street sweeper. It is closely allied with the Buffalo-Springfield Roller Co., and arrangements have been made for manufacturing. C. F. Greiner is president.

The Marquette Tool Co., Dayton, Ohio, has been incorporated with a capitalization of $50,000 by Henry A. Ritter, Jr., and Arthur F. Greer. It is a reorganization of the Buckeye Engineering Co. and the new company will take over the plant of the latter company at 126 East Third Street, Dayton.

The Automatic Refrigerating & Service Co., Springfield, Ohio, will shortly be incorporated with a capitalization of $200,000 to manufacture refrigerating machines. It has purchased the patents and equipment of the Narco Co., Wapakoneta, Ohio, and will operate that plant for a short time, but it is the intention to move it to Springfield. Among those interested in the new company are George Reed, of the Reed Mfg. Co.; Charles Smith, Armstrong Mfg. Co.; Herman Voges, Jr., Webster & Perks Tool Co., and William J. Grim, public accountant, all of Springfield.

The Carroll Chain Co., 63 Smith Place, Columbus, Ohio, has been incorporated with a capitalization of $100,000 to manufacture chains and will buy about $25,000 worth of equipment. Daniel Carroll is president, and other incorporators are William S. Carroll, F. E. Shaffmaster, Ralph H. Sweetzer and Walter Carroll.

The Columbus Forge & Iron Co., West First Street, Columbus, Ohio, has awarded contract to the Middle States Construction Co., Rock Road, for two one-story additions, totaling 100 x 100 ft. Foster Copeland is president.

Milwaukee

MILWAUKEE, Nov. 14.

Slow but steady improvement in inquiry, with a slight increase in sales, has given the machine tool market a more encouraging aspect the past week. Trade is still dull and quiet, but it is evident that the better feeling recently noted is based on substance. The high spot of interest is railroad buying. The automotive industries are taking a fair quantity of tools, but this business is of such a piecemeal nature that it requires the aggregate to give it a semblance of volume. Production is increasing slowly, but operations still are on a very small scale compared with normal capacity.

The Outagamie Limestone Co., Black Creek, Wis., has engaged H. O. Welden, consulting engineer, 10 South La Salle Street, Chicago, to design a quarry plant, finishing and crushing houses and auxiliary buildings estimated to cost about $125,000. It is planned to start construction this year and to place orders for considerable equipment at once. F. A. Maas is president.

The Standard Bakers' Machinery Co., Milwaukee, has been incorporated with a capital stock of $20,000 to manufacture equipment for commercial bakeries. The incorporators are E. Koch, A. E. Davidson and Waldemar C. Wehe, attorney, 425 East Water Street, Milwaukee. It is intended to lease a factory and purchase machined castings for assembling.

Schmalz Brothers, Prairie du Sac, Wis., have let the general contract to Willis & Deason, Janesville, Wis., for a brick and steel garage and service building, 60 x 133 ft., part two stories, estimated to cost $22,000. A small list of equipment will be purchased.

The Oshkosh Tractor Co., Oshkosh, Wis., has let the general contract to the Badger Concrete Co., local, for the erection of the superstructure of its new factory, 152 x 380 ft., one story, to cost about $175,000. Foundations are being completed. The architects are Auler & Jensen, Oshkosh. A small list of equipment will be purchased, but the bulk is provided by the purchase of the entire property of the LaCrosse Tractor Co., LaCrosse, Wis. A. D. Paine is president, and L. W. Melcher, works manager.

The State Board of Normal School Regents, Madison, Wis., has engaged Arthur Peabody, architect, to prepare plans for a new light, heat and power plant costing about $35,000 for the State Normal School at River Falls. It will be of brick and concrete, 50 x 85 ft. Details of equipment requirements are not yet available.

The Board of Education, Green Bay, Wis., has engaged Foeller, Schober & Stephenson, local architects, to furnish designs for the new East High School, estimated to cost $350,000. Provision will be made for manual training and domestic science departments.

The Alliance Investment Co., 115 Wisconsin Street, will build a one-story garage and service building, 75 x 150 ft., for the Milwaukee Oldsmobile Sales Co., 528-532 Broadway. Plans are being completed by Martin Tullgren & Sons, architects, 425 East Water Street. It will cost about $40,000 equipped.

The Burlington Blanket Co., Burlington, Wis., has purchased the former plant of the Wisconsin Dental Burr Co., at Hartford, Wis., which it has occupied under lease since July 1. It will start work immediately on a two-story addition, 40 x 100 ft., and a new boiler house accommodating one high and one low pressure boiler. Considerable new textile equipment, with individual electric motor drive, and a 1000-lb. electric elevator will be purchased.

The Board of Trustees, Marquette University, 1200 Grand Avenue, Milwaukee, has let the general contract to Walter W. Oeflein, Inc., 86 Michigan Street, for a brick and concrete boiler house at Fifteenth and Clybourn streets, to cost about $100,000. Specifications on equipment are now being determined. Dr. H. L. Banzhaf is business manager.

California

SAN FRANCISCO, Nov. 8.

The National Lead Co., 485 California Street, San Francisco, has awarded a contract to the Cahill-Vensano Co., 110 Sutter Street, for the erection of a new three-story plant at East Tenth Street and Forty-fifth Avenue, Oakland, Cal., to cost about $50,000.

The Hicks Dovetail Latch Co., Inglewood, Cal., manufacturer of special latches and other hardware products, has acquired about two acres of land in the northern section of the city for the erection of a new plant.

The San Diego Ice & Cold Storage Co., San Diego, Cal., is having plans prepared for a five-story cold storage plant at Eighth and N streets, 105 x 158 ft., estimated to cost $100,000 with machinery. Frank P. Allen is architect.

The Lake Hemet Water Co., Hemet, Cal., is arranging for the construction of a new hydroelectric power plant in the San Jacinto section, estimated to cost in excess of $100,000. W. S. Post, Central Building, Los Angeles, is consulting engineer.

The Southern California Body Co., Long Beach, Cal., has leased the plant of the California Wood Products Co., 1241-49 First Street, for the manufacture of automobile bodies, washing machines and similar specialties. Later it contemplates the construction of a new plant.

The American Petroleum Co., 343 Sansom Street, San Francisco, has awarded contract to Hannah Brothers, 142 Sansom Street, for a new two-story plant on the waterfront at Oakland, Cal., including a power house.

The Central South

ST. LOUIS, Nov. 14.

The Missouri-Pacific Railroad Co., St. Louis, will build additions to a number of car shops on its lines in the State, each extension to be approximately 65 x 150 ft., one-story and basement, and is estimated to cost about $15,000, exclusive of equipment. Work has commenced on the shop at Nevada, Mo. V. H. Winnberg, master mechanic, Sedalia, is in charge.

The Board of Education, West Plains, Mo., has completed plans for a two-story machine shop on Main Street, 75 x 120 ft., to be used for vocational training, and will commence work at an early date. It will cost about $14,000, exclusive of equipment.

The United Railway Co., Thirty-ninth Street and Park Avenue, St. Louis, is completing plans for a new three-story car repair plant, estimated to cost about $150,000.

Fire, Nov. 11, destroyed a portion of the car and locomotive shops of the Chicago, Rock Island & Pacific Railroad, Shawnee, Okla., with loss estimated in excess of $200,000, including equipment. It also destroyed the neighboring building of the Choctaw Cotton Compress Co.

The Coffeyville Ice Co., Coffeyville, Kan., will build a new ice-manufacturing plant to cost about $100,000. Herbert Forrest is general manager. F. R. Lawson, Nowata, Okla., is interested in the project. Plans have been completed.

The National Lamp Works of the General Electric Co., Nela Park, Cleveland, will hold in abeyance the completion of its new plant at St. Louis, to be occupied by the Missouri Glass Division of the company. The plant is practically ready for the machinery installation and this work will proceed when conditions in the industry warrant.

The Haynes-Langenberg Mfg. Co., 4045 Forest Park Boulevard, St. Louis, manufacturer of steam, hot-water and other furnaces and heating equipment, is said to be planning to rebuild the portion of its plant destroyed by fire, Nov. 6, with loss estimated at close to $100,000.

The Southern Cotton & Paper Co., Chattanooga, Tenn., has acquired about two acres for the erection of a new plant to manufacture paper products. The initial building will be one story, 60 x 150 ft. Machinery will be installed for a daily capacity of about 15 tons. Mercer Reynolds heads the company.

Miner D. Woodling, 510 Reliance Building, Kansas City, Mo., has awarded contract to the Fogel Construction Co., Reliance Building, for a four-story and basement automobile service and repair works, 100 x 142 ft., at 1219-27 Baltimore Street, to cost about $175,000.

The Burgess Coal Co., Mulberry, Kan., is planning to rebuild the tipple at its properties recently destroyed as the result of an explosion. Electrical and mechanical equipment, used in other departments, destroyed, will also be replaced.

The Moomaw Tool & Machine Co., 113 Main Street, Joplin, Mo., is considering the construction of a new one-story and basement plant, estimated to cost about $50,000. Elvin Moomaw heads the company.

Freight handling machinery will be installed at the new freight depot and loading dock to be constructed at Oklahoma City, Okla., by the Missouri, Kansas & Texas Railroad Co., St. Louis. It will be one-story, 45 x 130 ft., and 50 x 150 ft., respectively. Work will begin at once.

A four-story ice and cold storage plant, 120 x 150 ft., to cost about $100,000 with equipment, will be constructed at Sixth and Virginia streets, Joplin, Mo., by the A. B. Thomas Fruit Co., Seventh and Virginia streets. Plans are being drawn. A. B. Thomas is general manager.

The City Ice & Storage Co., Twenty-first and Campbell streets, Kansas City, Mo., has awarded contract to Alfred Johnson, 3920 Belleview Street, for a one-story mechanical shop, 100 x 140 ft., at Twenty-second and Harrison streets, for machine work and other service. George Carman, Gumbel Building, is architect.

The Excelsior Springs Water, Gas & Electric Co., Excelsior Springs, Mo., is negotiating for the purchase of the power plants and properties of the Plattsburg Light & Power Co., Plattsburg, Mo.; Kearney Electric Co., Kearney, Mo.; and the Holt Electric Light Co., Holt, Mo. Upon acquisition it is planned to make extensions in the power plants for increased generation, with new transmission lines and distributing system.

Seattle

SEATTLE, Nov. 8.

Jobbers report an improvement in the domestic and export demand for light tools, but inquiries are quiet for heavy machinery. Shipyard stocks of second-hand heavy duty machines have been so largely decimated the past 90 days as to become almost a negligible factor.

Work will be started on the proposed improvements to the waterworks system of Walla Walla, Wash., during the first quarter, according to W. C. Craig, commissioner of finance, but states that it will not be possible to receive bids for 60 days. Engineer Hussey has prepared new plans and specifications.

A sawmill will be built near Noti, Ore., according to the purchase of 43,000,000 ft. of timber by George Forcia and T. V. Warson, Battle Ground, Wash.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has acquired the plant of the Kilbourne & Clark Mfg. Co., Columbus Street, Seattle, manufacturer of electrical drills, etc. It will be used for the manufacture of certain specialties, including switchboard apparatus, with assembling and testing departments for electrical machinery manufactured by the company. Possession will be taken at an early date.

The Pacific Stove & Stamping Co., Tacoma, Wash., is planning to immediately rebuild the portion of its works recently destroyed by fire with a loss of about $50,000. T. M. Eggers is president.

The Washington Cord Tire Co., Seattle, has acquired 10 acres at Vancouver, Wash., as a site for a new plant to manufacture automobile tires and other rubber products. F. C. Plouf is president.

The Western Foundry & Furnace Co., 3002 South Chandler Street, Tacoma, Wash., recently reorganized, has arranged for the establishment of a department at its plant to manufacture electrical specialties, including electrical heaters, clothes dryers, etc. A. Z. Love is president, and J. W. Wright, vice-president.

The N. E. Perry Co., Seattle, has acquired property at Boston Harbor, near Olympia, Wash., for $250,000, and has preliminary plans under way for a large lumber mill. W. H. Perry, one of the heads of the company, is in charge.

The Miles City Refining Co., Miles City, Mont., has acquired a local site and has plans under way for the erection of a new oil refinery. R. H. Daniels is secretary.

Canada

TORONTO, Nov. 14.

Machine tool demand continues fairly active, but the improvement the past month has not been as pronounced as dealers expected. Sales however, show progress and business booked in October was better than any month this year. Inquiries for nearly all kinds of equipment are being received in increasing numbers and many are expected to turn into sales early in the new year. Equipment for replacement purposes is in fairly good demand. Used tools are selling more freely than new lines, but this is considered merely a temporary condition. Small tools have been selling well for some time and show no signs of falling off.

The Stirling Trunk Co., New York City, has leased space at 510 King Street East, Toronto, and will establish a temporary factory there. It is the intention to erect a plant of its own in the spring.

The Red Arrow Tires, Ltd., 309 George Street, Peterborough, Ont., is receiving bids and will shortly start work on the erection of a manufacturing plant.

The Bishopric Lent Co., Cincinnati, Ohio, will erect a sulphate plant at Stink Lake, near Dunkirk, Sask., and has awarded general contract to S. Pritchard, 1120 Fourth Avenue N. W., Moose Jaw, Sask. The project includes power plant, equipped with steam engines, boilers and generators and will cost $100,000.

The Molson Brewery, 906 Notre Dame Street East, Montreal, is building a boiler house to cost $80,000.

The Gurney Foundry Co., 510 Queen Street West, Toronto, will make alterations to its plant to cost $18,000.

The Alliance Brass Mfg. Co., is establishing a plant at Peterborough, Ont. Machinery is being installed in the building and it is expected that operations will commence next February.

The Atlas Construction Co., 37 Delmont Street, Montreal, has the general contract for construction of an electric pumping station at Point St. Charles, Montreal.

The Town Council, Verdun, Que., is having plans prepared for the installation of two 5,000,000 gal. electric pumps, to replace present steam system.

It is stated that the Forbes Vibration Co., St. Louis, Mo., proposes to establish a plant in Canada for the manufacture of toys, etc.

The Prince Rupert Pulp & Paper Co., 602 Pacific Building, Vancouver, B. C., plans to start work soon on the first unit of a pulp mill at Prince Rupert, B. C., to have a daily capacity of 40,000 tons and to cost $1,000,000.

Silverwoods, Ltd., London, Ont., will shortly commence the erection of a factory at Chatham, Ont., to cost $75,000, to make artificial ice, etc.

The Roe Machine Tool Co.'s plant, Hamilton, Ont., is being reopened for the manufacture of vises and other metal working tools. Previously to the closing down of this plant several months ago, a general line of machine tools was manufactured.

The plant of Hiram Walker & Sons, metal products, Windsor, Ont., is being overhauled and organized. The company is a producer of special wires for electrical use, and this department is being moved to a separate building.

Manufacturers Buy Bonds

DETROIT, Nov. 12.—A significant move on the part of certain Detroit manufacturers is reported by bankers. During the last two or three weeks, a large number of Detroit manufacturing firms have been buying heavily of Liberty bonds, the total acquisitions being between $3,000,000 and $4,000,000 weekly. The idea is that with material prices uncertain and sales gaining slowly, the manufacturers are putting their current surplus into securities that will be wholly liquid when the funds so invested are needed.

The reason for the appointment of a receiver for the Lincoln Motor Car Co., Detroit, may be summed up in a few words. As compared with its financial situation at the end of last year, its statement of Nov. 8 of this year shows a deficit of $1,437,280 against a former surplus of $1,785,535. A statement issued by the receiver places the assets of the company at $14,800,000 and the liabilities at $8,237,280. Sales of cars this year have been a little below 200 a month, that figure being the smallest possible production at a profit. However, sales have increased every month and September and October were the largest months in the history of the company. According to the receiver, plans are under way for reorganization which will permit production with the least possible interruption. The blanket mortgage on the plant and other assets sold to Dr. Fred T. Murphy, of Grosse Pointe, in July, 1921, was last week converted into a permanent lien on all property of the company. This indebtedness now stands at $1,882,000.

The Republic Motor Truck Co., Alma, Mich., which had $500,000 of its $2,500,000 7 per cent notes mature Nov. 1, has mailed a letter to note holders asking an extension on such notes until 1926. The company is unable to meet the payment because business conditions have not permitted the liquidation of inventories and at the same time the retention of sufficient cash as working captal.

The Exeter Machine Works, Inc., West Pittston, Pa., has appointed the Hendrie & Bolthoff Mfg. & Supply Co., Denver, Col., exclusive sales agent for its rotary pump line in the Denver district.

IRON AND INDUSTRIAL STOCKS

Less Irregularity In Price Movements During the Past Week

Less irregularity attended price movements of iron and industrial stocks the past week, the trend being definitely upward. New high record prices for 1921 were established, with shares of the steel producing companies assuming leadership most of the time. The advance in United States Steel common perhaps has been more consistent than that in other steel shares. This possibly is explained by the recovery in the steel industry and by the fact that the floating supply of Steel common is probably less than a third of what it was only a few years back. That the Steel Corporation within a month or so will offer stock to its employees under its 1922 profit-sharing plan may also account in part for the strength of the shares. In most quarters, however, the upswing not only of steel, but of practically all stocks is largely attributed to buying based on cheaper money than has been experienced since the early days of the industrial war boom, and to the growing confidence in our industrial outlook. The somewhat freer buying of equipment by the railroads also has brought investors into the securities market. Then again, the disarmament conference at Washington, with its possibilities of a reduction in taxes and a lessening in war risks, appeals to the investor. The announcement by Great Britain that it intends to meet interest on its indebtedness to us has been another reassuring investment factor.

The range of prices on active iron and industrial stocks from Monday of last week to Monday of this week was as follows:

Allis-Chalm. com.	33¾ - 36⅝	Lackawanna Stl.	40¼ - 42
Allis-Chalm. pf..	80 - 82	Midvale Steel....	24⅜ - 25½
Am. Can com...	30¼ - 31⅞	Nat. Acme	13 - 13¾
Am. Can pf.....	87¾ - 90¼	Nat. E. & S. com	39 - 41¼
Am. C. & F. com.	132 -137¼	N. Y. Air Brake.	57 - 60¾
Am. C. & F. pf.. ..	-115	Nova Scotia Stl.	20⅛ - 22⅞
Am. Loco. com..	91½ - 94⅝	Pittsb'gh Stl. pf. ..	- 83½
Am. Loco. pf....107	-108	Pressed Stl. com.	60 - 61⅞
Am. Rad'tor com.	78½ - 81	Pressed Stl. pf.. ..	- 91
Am. Stl. Fd. com.	27¾ - 30½	Ry. Stl. Spg. com.	84½ - 89¼
Am. Stl. Fd. pf.	86¾ - 90¾	Republic com....	48½ - 51⅝
Bald. Loco. com.	89⅝ - 96¼	Republic pf.....	82 - 83½
Bald. Loco. pf...101	-102½	Sloss, com.....	38⅜ - 39¾
Beth. Stl. Cl. B..	55⅝ - 58¼	Sloss pf..... ..	- 75
Beth. Stl. 8% pf.102½	-105	Transue-Williams ..	- 32
Colo. Fuel.....	24 - 24½	Un. Alloy Stl...	25½ - 26¼
Cruc. Stl. com...	62½ - 66	U. S. Pipe com.. ..	- 15½
Gen. Electric....133	-135¼	U. S. Pipe pf....	45⅜ - 47
Gt. No. Ore Cert.	31⅞ - 32¾	U. S. Steel com..	80¼ - 83⅜
Gulf States Stl..	38½ - 40¼	U. S. Steel pf...110¾	-112
Int. Har. com...	75 - 78⅞	Vanadium Stl...	31¾ - 33⅝
Int. Har. pf.....100	-104		

Industrial Finances

The Carroll Foundry & Machine Tool Co., Bucyrus, Ohio, has called a meeting of the stockholders to be held in Cleveland Dec. 5 to approve action taken by the board of directors, authorizing a bond issue of $200,000.

The Charcoal Iron Co. of America, Detroit, has disposed of a bond issue of $4,000,000, the proceeds to be used for general operations, expansion, etc. Frank W. Blair is president.

In the three months, ended Sept. 30, last, the Allis Chalmers Mfg. Co. billed out $5,369,612 goods, contrasted with $8,268,441 during the corresponding period last year, a decrease of $2,898,829. The net profits for that period were $421,366, which, after making allowances for the preferred dividend, were equal to 51c. a share on the outstanding common stock. In the preceding quarter the company earned $1.34 a share on its common stock, and in the quarter, ended Sept. 30, 1920, $2.49. Unfilled orders on hand Sept. 30, amounted to $7,260,574, as against $9,472,772 on June 30, and $19,814,948 a year ago.

A net loss, after charges, depreciation and Federal taxes, of $287,806 was reported yesterday by the Gulf States Steel Co. for the nine months ended Sept. 30. Gross earnings totaled $57,595, and the deficit, after dividends, $392,806. Notes and accounts receivable amounted to $1,136,830 and cash $530,190. Accounts and bills payable totaled $1,206,323.

A public offering was made last week of $4,000,000 Charcoal Iron Co. of America 8 per cent ten-year closed first mortgage bonds dated Nov. 1, and maturing in 1931. The purpose of this issue is to retire outstanding indebtedness and to provide additional working capital.

A public offering is being made of $3,250,000 Taylor-Wharton Iron & Steel Co. first and refunding sinking fund 7½ per cent bonds dated July 1, last, and maturing in 1946, a part of an authorized issue of $4,000,000.

The Republic Motor Truck Co., which had $500,000 of its $2,500,000 7 per cent serial notes maturing Nov. 1 was unable to meet payment due to its inability to liquidate inventories sufficiently to meet the payment and maintain adequate working capital. The note holders were asked to extend payment to 1926.

In connection with the proposed taking over of the Titusville Forge Co. by the Penn Seaboard Steel Corporation, a letter to the stockholders says: "Notwithstanding the very serious business depression the condition of the Penn Seaboard Steel Corporation has been materially improved. Since Jan. 1, 1921, the current and funded debt has been reduced $1,035,000. Inventories have been reduced approximately $467,000. Although operations have not been over 20 per cent of capacity and the corporation has been operating at a loss, monthly losses have been materially lessened during recent months by rigid economy in a reduction of forces, wages and salaries." Stockholders on Nov. 14 will be asked to authorize an increase in the Penn Seaboard Steel Corporation's capitalization from 350,000 to 700,000 shares of no par value, in connection with the proposed consolidation.

A deficit of $1,249,136, after charges and Federal taxes, resulted from operations of the Midvale Steel & Ordnance Co. for the third quarter. This compares with a deficit of $1,289,393 in the preceding quarter and a surplus of $4,448,079 in the corresponding period of 1920. Net earnings, after taxes, were $688,238, against $6,886,625 in the same quarter a year ago. Interest charges were $745,048 and depreciation, etc., $1,192,326.

Profits of the Crucible Steel Co. of America in 1921 Half Those of Previous Year

The report of the Crucible Steel Co. of America for the year, ended Aug. 31, shows a net profit after ordinary charges and taxes of $5,547,245, or $7.59 per share on the common stock after preferred dividends. For the previous year net profits of $11,780,021 or $20.06 per share on the common stock were shown. The net profits for the past year, however, are reported as before deductions for depreciation and amortization, for which a charge of $4,575,069 is set up against accumulated surplus. The annual report does not make it plain how much of this charge is attributable to the fiscal year. If it were all charged off against the year's operations, the profits amount to but $972,177, or 88c. a share on its preferred stock.

The consolidated profit and loss account of the company and its subsidiaries compares with that for the previous year as follows:

	1921	1920	Decrease
Total profits	$6,969,424	$17,274,489	$10,305,065
Repairs, depreciation, etc.	....	3,775,291	3,775,291
Bond interest	306,250	312,333	6,083
Inventories, adjustment, etc.	*1,115,929	1,406,844	290,915
Net profits	5,547,245	11,780,021	6,232,776
Preferred dividends	1,750,000	1,750,000	.....
Surplus	3,797,245	10,030,021	6,232,776

*Includes $191,429 for depreciation in foreign exchange.

The balance sheet shows total assets and liabilities at the close of the year of $134,513,436, as contrasted with $145,587,227 on Aug. 31, 1920. The most striking changes in the assets are an increase of $2,101,067 in the value of real estate, plants, etc., a decrease of $5,383,011 in inventories, and a decrease of $6,782,013 in notes and accounts receivable. The liabilities show shrinkages of $250,000 in outstanding bonds, $2,000,000 in notes outstanding, and $6,058,857 in accounts payable.

The company's unfilled orders for the product of its tool steel mills on Aug. 31, amounted to 34,374 tons. At the close of the previous year they were 74,960 tons. At the close of the year the company had 6513 stockholders, of which 2097 were common and 4416 preferred.

H. S. Wilkinson, chairman of the board of directors in his report to the stockholders says in part: "Your company has passed through a very trying year for both the management and the employees. During the first three months of our fiscal year earnings were satisfactory, but in the second quarter the falling off in orders started and we were obliged to depend upon the unfilled orders on the books for a part of our business. During the balance of the year there was a steady decline in orders until the month of August, when, for the first time during the year, our orders showed an increase over the preceding month.

"During the year we have expended $2,101,067, in completing the by-product coke ovens and such other improvements as were under way at the beginning of the year. We have successfully operated our new blast furnace and coke ovens. We need only the resumption of business upon a normal basis to enable the company to enjoy the benefits of these improvements, as we now have the capacity to make a sufficient quantity of both coke and pig iron to meet all our requirements."

Plans of New Companies

The Ferguson-Allan Co., has leased the plant of the old Progressive Structural Steel Co. at 504 Bailey Avenue, Buffalo, including equipment, and will engage in fabricating structural steel buildings, steel tanks, steel stacks, water towers and other steel plate construction work. The company is in the market for a new or used crane, 3 to 5-ton capacity, 40 or 50 ft. span, hand or electric.

The Paradox Battery Mfg. & Service Co., whose present office is in care of Wille & Co., 401 Berlin Arcade Building, Milwaukee, was recently incorporated in Wisconsin to manufacture storage batteries of all descriptions. The company will manufacture about 50 per cent of the material used.

The Wetmore Mechanical Laboratory Co., 312 Montgomery Building, Milwaukee, organized in 1915 by Charles P. Wetmore and P. B. Rogers is again actively engaged in engineering and manufacturing work. Charles P. Wetmore is president and P. B. Rogers secretary and treasurer. This company was the designer and manufacturer of the Wetmore inserted blade expanding reamer, extensively used in the production of shells during the war, and later developed the commercial Wetmore reamers of this type. The Wetmore Mechanical Laboratory Co. with Mr. Wetmore in charge of the mechanical work will devote its efforts to the developing of mechanical devices and in the perfecting of manufacturing methods including jigs, fixtures and tool work. The company is now manufacturing several articles for companies in which it has also become a stockholder and is in position to develop and handle more contract manufacturing work of this kind. Die and screw machine work is also included. Factory and office are located at 129 Michigan Street, Milwaukee.

The H. A. Blake Machine & Foundry Co., recently incorporated with a capital of $50,000, was organized to take over H. A. Blake & Son's foundry and machine shop, Cheboygan, Mich., and other properties owned by H. A. Blake, who died January, 1920. These properties were valued at $37,840. The directors are: F. S. Ritter, J. A. Blake and W. H. Blake. The company does not contemplate building for some time, as present buildings will serve its purpose at least temporarily. It will carry on the old business with a specialty manufacturing department.

The Industrial Equipment Co., Milwaukee, will confine its activities for the present to the sale of machinery, small tools and shop equipment. Any manufacturing which it will do will be on a contract basis. It is looking for meritorious lines of shop supplies and equipment to handle on an exclusive basis in the State of Wisconsin and the upper peninsula of Michigan. It expects to have 10 branch offices established in the larger cities of the State by Jan. 1.

The Fenton Auto Lock Co., Fenton, Mich., recently incorporated, has taken over the Gilland Auto Lock Co., Grand Rapids, Mich., which had a capital stock of $10,000. The equipment of the Grand Rapids plant will be moved to Fenton, a plant having been purchased at Fenton to manufacture the company's product, which is a patented lock for automobiles. The company expects to get into production by Dec. 1. It will require soon some additional machine tools, particularly lathes, punch presses and milling machines.

The Elizabeth Boiler Repair & Sheet Metal Works, Elizabeth, N. J., recently incorporated, will repair boilers and turn out all classes of sheet metal work.

The Northern Radio & Electric Co., Seattle, Wash., intends to be distributor of apparatus which it will have manufactured in plants in that city, but if this is not found feasible, it will consider manufacturing on its own account. It is operating a radio telephone on the Seattle *Post-Intelligencer*, broadcasting news and music daily.

The Exeter Machine Works, Inc., West Pittston, Pa., has appointed the English Tool & Supply Co. exclusive sales agent for its rotary pump line in the Kansas City district. The English Tool & Supply Co. specializes in the marketing of tools and supplies for railroads, machine shops and mills.

The W. P. MacKenzie Co. has been appointed exclusive sales agent in the Philadelphia and Baltimore districts. The MacKenzie company is a sales engineer, specializing in the marketing of pumping machinery, having offices in the Pennsylvania Building, Philadelphia, and in the Equitable Building, Baltimore.

Payne Dean, Ltd., 103 Park Avenue, New York, manufacturer of Dean control for electrical operation of water, gas and high pressure steam valves, has established offices in Pittsburgh and Chicago. C. J. Burrage, captain in the army, and formerly of the engineering department of the Cutler-Hammer Mfg. Co., is in charge of the Pittsburgh office in the Bessemer Building. A. H. Kohlbusch, superintendent of construction for the Public Service Electric Co., has been placed in charge of the Chicago office in the Lumber Exchange Building, 11 South LaSalle Street.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

	Per Lb.
Bars:	
Refined bars, base price	2.68c.
Swedish bars, base price	10.00c.
Soft steel bars, base price	2.68c.
Hoops, base price	3.53c.
Bands, base price	3.28c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	2.78c.
Channels, angles and tees under 3 in. x ¼ in., base	2.68c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.75c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	2.95c.
Toe calk, ½ x ⅜ in. and larger	3.45c.
Cold-rolled strip, soft and quarter hard	6.25c. to 7.25c.
Open-hearth spring steel	4c. to 6c.
Shafting and Screw Stock:	
Rounds	3.88c.
Squares, flats and hex	4.38c.
Standard cast steel, base price	12.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

¼ in. and heavier	2.78c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.53c.
No. 12	3.58c.
No. 14	3.63c.
No. 16	3.73c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	3.80c. to 4.05c.	.....
Nos. 22 and 24	3.85c. to 4.10c.	4.50c.
No. 26	3.90c. to 4.15c.	4.55c.
No. 28	4.00c. to 4.25c.	4.65c.
No. 30	4.25c. to 4.50c.	.....

No. 28, 36 in. wide, 10c. higher.

Galvanized

	Per lb.
No. 14	4.10c. to 4.35c.
No. 16	4.25c. to 4.50c.
Nos. 18 and 20	4.40c. to 4.65c.
Nos. 22 and 24	4.55c. to 4.80c.
No. 26	4.70c. to 4.95c.
No. 27	4.85c. to 5.10c.
No. 28	5.00c. to 5.25c.
No. 30	5.50c. to 5.75c.

No. 28, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt...	—55	—40	¾ in. Butt...	—30	—13
¾ in. Butt...	—60	—46	1-1½-in. Butt.	—32	—15
1-3 in. Butt..	—62	—49	2 in. Lap.....	—27	—10
3½-6 in. Lap.	—59	—45	2½-6 in. Lap.	—30	—15
7-8 in. Lap...	—55	—41	7-12 in. Lap...	—23	— 7
9-12 in. Lap..	—54	—40			

Steel Wire

BASED PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	4.00c.
Annealed soft	4.00c.
Galvanized annealed	4.75c.
Coppered basic	4.50c.
Tinned soft Bessemer	6.00c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE	
High brass sheet	16¼c. to 19¼c.
High brass wire	17¼c. to 21¾c.
Brass rod	14¼c. to 20¾c.
Brass tube, brazed	27½c. to 31½c.
Brass tube, seamless	19 c. to 20½c.
Copper tube, seamless	20½c. to 22¾c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 20½c. to 23½c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14-20		
			Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb....	$6.05	$5.80
		90 lb....	6.15	5.90
		100 lb...	6.25	6.00
IC..	$10.25	$8.75	IC...	6.40	6.15
IX..	11.50	10.25	IX...	7.40	7.15
IXX..	13.25	11.75	IXX...	8.40	8.15
IXXX..	15.00	13.50	IXXX...	9.40	9.15
IXXXX..	16.50	15.25	IXXXX...	10.40	10.15

Terne Plates

8-lb. Coating 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	10.00

Tin

Straits, pig	31c.
Bar	38c. to 40c.

Copper

Lake ingot	15½c.
Electrolytic	15¼c.
Casting	15c.

Spelter and Sheet Zinc

Western spelter	6½c. to 7c.
Sheet zinc, No. 9 base, casks	11½c. open 12c.

Lead and Solder*

American pig lead	5¾c. to 6¼c.
Bar lead	6¾c. to 7c.
Solder, ½ and ½ guaranteed	22¼c.
No. 1 solder	20¾c.
Refined solder	17¾c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	80c.
Commercial grade, per lb	40c.
Grade D, per lb	35c.

Antimony

Asiatic	6½c. to 6¾c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	29c. to 31c.

Old Metals

The market is quiet with values practically unchanged. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	10.50
Copper, heavy and wire	9.75
Copper, light and bottoms	8.00
Brass, heavy	5.00
Brass, light	4.00
Heavy machine composition	7.50
No. 1 yellow brass turnings	4.75
No. 1 red brass or composition turnings	6.50
Lead, heavy	3.75
Lead, tea	2.50
Zinc	2.25